



**OILPATH**  
manufacturers of hydraulic control equipment

A.C.N. 007 683 472

# OP3 VALVE ASSEMBLY

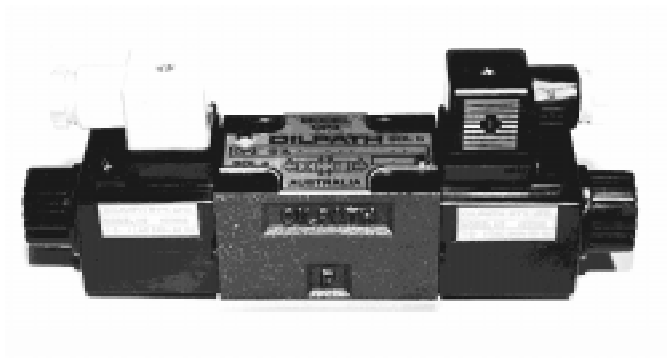
ASSEMBLY PROCEDURE AND PARTS LISTS FOR  
AUTHORISED DISTRIBUTORS

**ISSUED TO:**

COMPANY  
CONTACT  
POSITION  
ISSUE DATE 20-1-94

**SERIAL NUMBER:**

**REVISION LEVEL:** A



## VALVE ASSEMBLY CONFIGURATION INDEX

ASSEMBLY SHEET No.	DESCRIPTION OF VALVE ASSEMBLY	PAGE No.
A1	OP3 - S - A1 - 3SO - N - 1 - AC & DC	5
A2	OP3 - S - A1 - 2SA - N - 1 - AC & DC	7
A3	OP3 - S - A1 - 2SB - N - 1 - AC & DC	9
A4	OP3 - S - A2 - 2SA - N - 1 - AC & DC	11
A5	OP3 - S - A2 - 2SB - N - 1 - AC & DC	13
A6	OP3 - S - B1 - 3SO - N - 1 - DC	15
A7	OP3 - S - B1 - 3SO - N - 1 - AC	17
A8	OP3 - S - B1 - 2SA - N - 1 - DC	19
A9	OP3 - S - B1 - 2SA - N - 1 - AC	21
A10	OP3 - S - B1 - 2SB - N - 1 - DC	23
A11	OP3 - S - B1 - 2SB - N - 1 - AC	25
A12	OP3 - S - B3 - 3SO - N - 1 - DC	27
A13	OP3 - S - B3 - 3SO - N - 1 - AC	29
A14	OP3 - S - B3 - 2SA - N - 1 - DC	31
A15	OP3 - S - B3 - 2SA - N - 1 - AC	33
A16	OP3 - S - B3 - 2SB - N - 1 - DC	35
A17	OP3 - S - B3 - 2SB - N - 1 - AC	37
A18	OP3 - S - B5 - 3SO - N - 1 - DC	39
A19	OP3 - S - B5 - 3SO - N - 1 - AC	41
A20	OP3 - S - B5 - 2SA - N - 1 - DC	43
A21	OP3 - S - B5 - 2SA - N - 1 - AC	45
A22	OP3 - S - B5 - 2SB - N - 1 - DC	47
A23	OP3 - S - B5 - 2SB - N - 1 - AC	49
A24	OP3 - S - C1 - 3SO - N - 1 - AC & DC	51
A25	OP3 - S - C1 - 2SA - N - 1 - AC & DC	53
A26	OP3 - S - C1 - 2SB - N - 1 - AC & DC	55
A27	OP3 - S - D1 - 3SO - N - 1 - AC & DC	57
A28	OP3 - S - D1 - 2SA - N - 1 - AC & DC	59
A29	OP3 - S - D1 - 2SB - N - 1 - AC & DC	61
A30	OP3 - S - F1 - 2SA - N - 1 - AC & DC	63
A31	OP3 - S - F1 - 2SB - N - 1 - AC & DC	65
A32	OP3 - S - F1 - 2SM - N - 1 - AC & DC	67
A33	OP3 - S - F1 - 2SD - N - 1 - AC & DC	69
A34	OP3 - S - H1 - 3SO - N - 1 - AC & DC	71
A35	OP3 - S - H1 - 2SA - N - 1 - AC & DC	73
A36	OP3 - S - H1 - 2SB - N - 1 - AC & DC	75

### VALVE ASSEMBLY PARTS LIST

PRODUCT NUMBER	DESCRIPTION
203001	OP3 Valve Body
240022	End Plug
246016	Detent Sleeve (counter bore 1.8mm deep)
246017	Offset Sleeve (counter bore 1.8mm deep)
246018	Offset Sleeve (counter bore 3.3mm deep)
248027	B Spool end
249021	A1 & A2 Spool
249022	A3 Spool
249023	B1 Spool
249025	B3 Spool
249027	B5 Spool
249032	C1 Spool
249035	D1 Spool
249036	E1 Spool
249037	F1 Spool
249038	G1 Spool
249039	H1 Spool
251010	Offset Washer (1.8mm step)
251011	Stop washer (4.0mm long)
251014	Offset Washer (3.3mm step)
251015	Cup Washer (counter bore 1.1mm deep)
401020	P15 "O" Ring nitrile
401023	BS 012 "O" Ring nitrile
401024	"O" Ring 5 X 1 viton
401025	S24 "O" Ring (coil large) nitrile
401026	BS 019 "O" Ring (coil small) nitrile
401030	P15 "O" Ring viton
401031	BS 012 "O" Ring viton
408011	Coil retaining nut
409005	OP3 Packaging box
409006	OP3 Plastic packaging bag 225mm X 360mm
415036	M3 X 6 S/Steel Pan head screws
415037	M5 X 25 S.H.C.S. Grade 12.9
416039	Light return spring 1.0mm dia X 15.8mm
416040	Heavy return spring 1.25mm dia X 15.0mm
416041	Detent circlip spring 0.5mm dia
416042	Memory spring 1.25mm dia X 6.5mm
417009	Detent chrome ball 3/32" dia
418011	Spring washer (stamped)
418012	Spring spacer (1.5mm thick)
420008	PHI - M3 hardened inserts
420010	Plastic cover plate
420012	Solenoid name plate 12 volts DC
420013	Solenoid name plate 24 volts DC
420014	Solenoid name plate 110 volts AC
420015	Solenoid name plate 240 volts AC
420016	Solenoid name plate 24 volts AC
420024	Sel-lock spring dowel pin 3.0mm dia X 8mm long
420031	Hirschmann electrical connector GDM 2011 "A" grey
420032	Hirschmann electrical connector GDM 2011 "B" black
420033	Solenoid push pin 30.7mm long
420034	Solenoid push pin 34.0mm long as standard
420035	Electrical connector GDML 2011 (with light) "A" grey
420036	Electrical connector GDML 2011 (with light) "B" black

### VALVE ASSEMBLY PARTS LIST

PRODUCT NUMBER	DESCRIPTION
420037	Electrical connector GDM 2011 (with surge ABS) "A" grey
420038	Electrical connector GDM 2011 (with surge ABS) "B" black
421001	Identification plate A1 spool 3SO
421002	Identification plate A1 spool 2SA
421003	Identification plate A1 spool 2SB
421004	Identification plate B1,B3 & B5 spools 3SO
421005	Identification plate B1,B3, & B5 spools 2SA
421006	Identification plate B1,B3, & B5 spools 2SB
421007	Identification plate C1 spool 3SO
421008	Identification plate C1 spool 2SA
421009	Identification plate C1 spool 2SB
421010	Identification plate D1 spool 3SO
421011	Identification plate D1 spool 2SA
421012	Identification plate D1 spool 2SB
421013	Identification plate E1 & F1 spools 2SA
421014	Identification plate E1 & F1 spools 2SB
421015	Identification plate E1 & F1 spools 2SM
421016	Identification plate E1 & F1 spools 2SD
421017	Identification plate H1 spool 3SO
421018	Identification plate H1 spool 2SA
421019	Identification plate H1 spool 2SB
421020	Identification plate A2 spool 2SA
421021	Identification plate A2 spool 2SB
421022	Identification plate blank
422001	Solenoid tube DC
422002	Solenoid tube AC
423001	Solenoid coil 12 volts DC
423002	Solenoid coil 24 volts DC
423003	Solenoid coil 24 volts AC 50 Hz
423004	Solenoid coil 110 volts AC 50 Hz
423005	Solenoid coil 240 volts AC 50 Hz

### COMPLETE SOLENOID ASSEMBLIES

PRODUCT NUMBER	COMPLETE SOLENOID ASSEMBLIES CONSIST OF
407004	110 volts A C - - - - P15 "O" Ring nitrile 401020
407005	240 volts AC - - - - S24 "O" Ring nitrile 401025
407006	12 volts DC - - - - BS 019 "O" Ring nitrile 401026
407007	24 volts DC - - - - Solenoid push pin Std. 34.0mm long 420034
407009	24 volts AC - - - - (above length unless otherwise specified)
	- - - - Coil retaining nut 408011
	<b>APPLICABLE SOLENOID TUBE</b>
	----- DC 422001
	----- AC 422002
	<b>APPLICABLE SOLENOID COIL</b>
	----- 12 volts DC 423001
	----- 24 volts DC 423002
	----- 24 volts AC 50 Hz 423003
	----- 110 volts AC 50 Hz 423004
	----- 240 volts AC 50 Hz 423005

## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A1

It applies to valves with the following ordering codes:

1. OP3 - S - A1 - 3SO - N - 1 - DC12
2. OP3 - S - A1 - 3SO - N - 1 - DC24
3. OP3 - S - A1 - 3SO - N - 1 - AC24
4. OP3 - S - A1 - 3SO - N - 1 - AC110
5. OP3 - S - A1 - 3SO - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the counterbores of item No.11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
15. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **5**

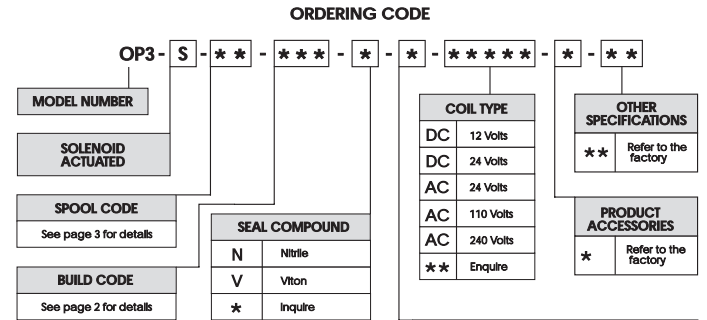
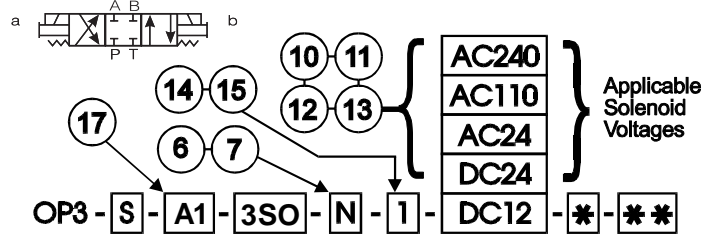
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A1**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421001	1	Identification plate
17.	249021	1	Spool type A1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.			
21.			
22.			

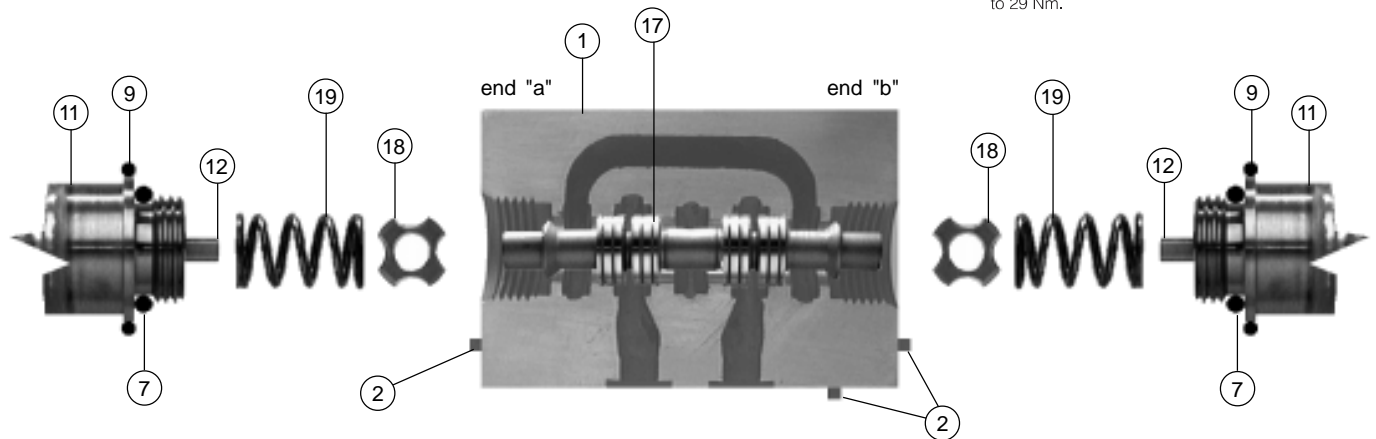
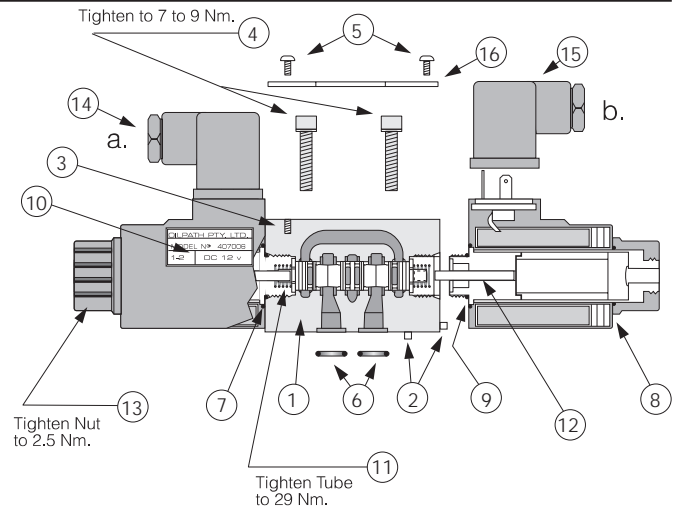


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia

21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

#### WARNING !

Incorrect selection and or improper assembly of the components in this literature can result in damage to property or personal injury. All care should be taken when assembling the hydraulic valve. Please contact your nearest Oilpath distributor or the factory direct if clarification on the assembly of a valve is required.

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#### WARRANTY

Oilpath products are warranted to be free of defects in material or workmanship. This warranty voids all other warranties, whether expressed or implied, and shall be in effect for 6 months from date of purchase. The warranty is limited to replacement or repair, excluding seals or damage arising from misuse or incorrect installation. The company accepts no liability for faults caused by improper use or faulty maintenance of the product, or operation beyond recommended specifications, or contingent or consequential loss or damage under any situation whatsoever. All unauthorised modifications to the product automatically voids the conditions of this warranty.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. 7

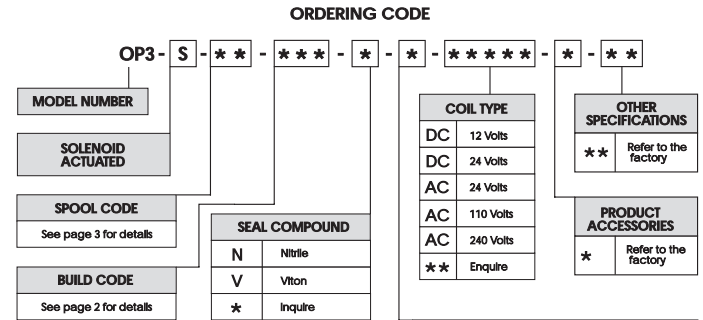
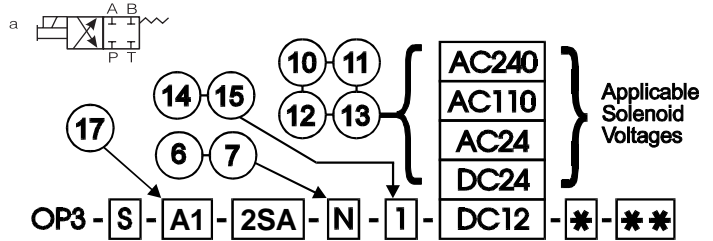
Revision Level A

Issue Date 20-1-94

### ASSEMBLY SHEET No. A2

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421002	1	Identification plate
17.	249021	1	Spool type A1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4.0 mm long
22.			



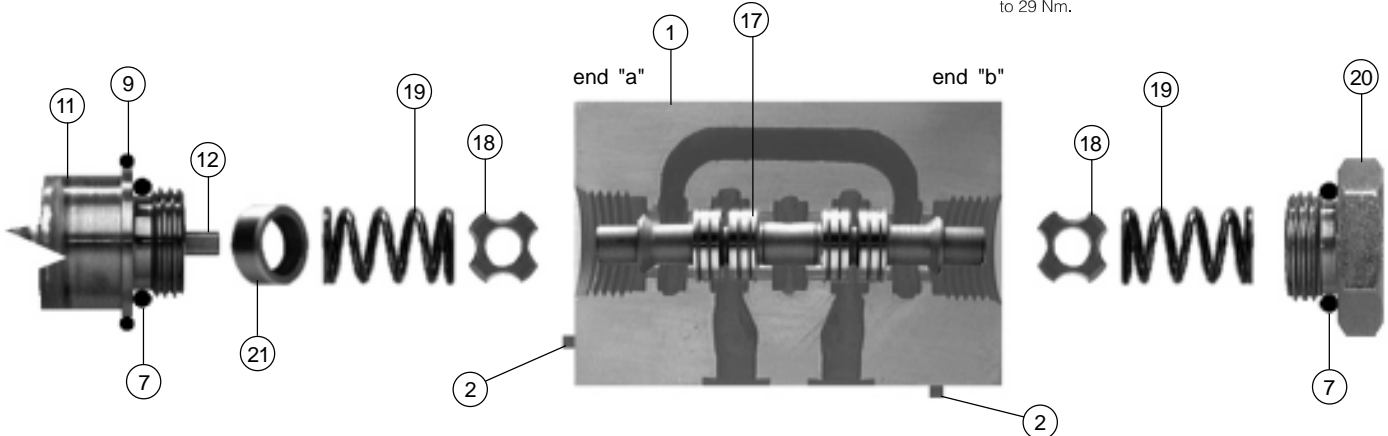
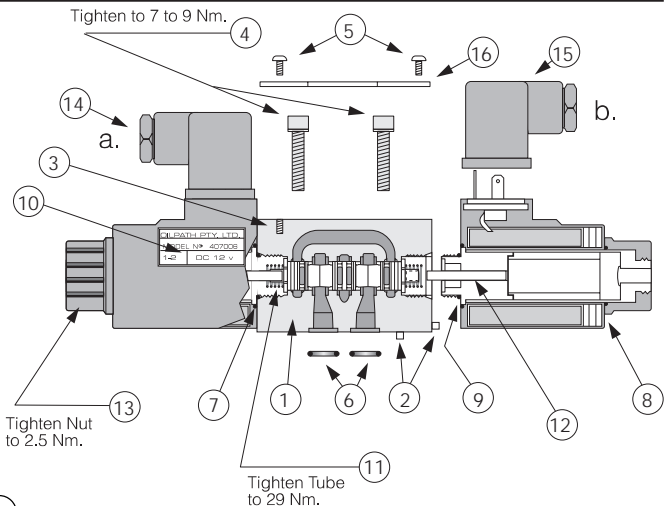
#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

Manufactured by :

**OILPATH PTY. LTD.**  
A.C.N. 007 683 472  
Incorporated in South Australia

21 Deloraine Road,  
Edwardstown, South Australia 5039

Ph: (08) 2774933 Fax: (08) 2779126

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**OILPATH PTY LTD RESERVE THE RIGHT TO CHANGE SPECIFICATIONS, OR TO DISCONTINUE ANY PRODUCTS LISTED IN THIS DOCUMENT WITHOUT NOTICE.**

#### WARRANTY

Oilpath products are warranted to be free of defects in material or workmanship. This warranty voids all other warranties, whether expressed or implied, and shall be in effect for 6 months from date of purchase. The warranty is limited to replacement or repair, excluding seals or damage arising from misuse or incorrect installation. The company accepts no liability for faults caused by improper use or faulty maintenance of the product, or operation beyond recommended specifications, or contingent or consequential loss or damage under any situation whatsoever. All unauthorised modifications to the product automatically voids the conditions of this warranty.

## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A2

It applies to valves with the following ordering codes:

1. OP3 - S - A1 - 2SA - N - 1 - DC12
2. OP3 - S - A1 - 2SA - N - 1 - DC24
3. OP3 - S - A1 - 2SA - N - 1 - AC24
4. OP3 - S - A1 - 2SA - N - 1 - AC110
5. OP3 - S - A1 - 2SA - N - 1 - AC240

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "b" and tighten to 29 Nm.
9. Then screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **9**

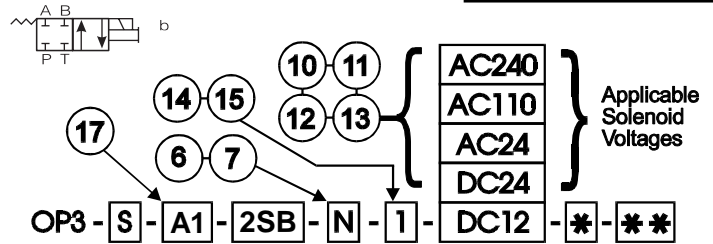
Revision Level **A**

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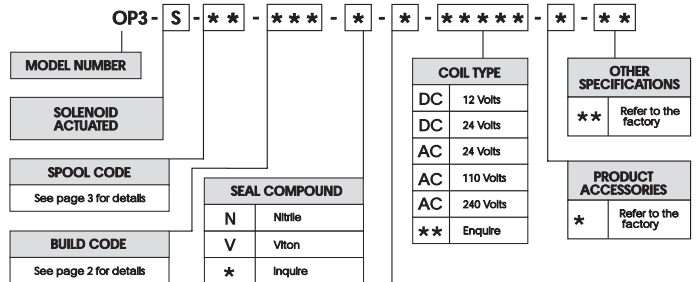
### ASSEMBLY SHEET No. **A3**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421003	1	Identification plate
17.	249021	1	Spool type A1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

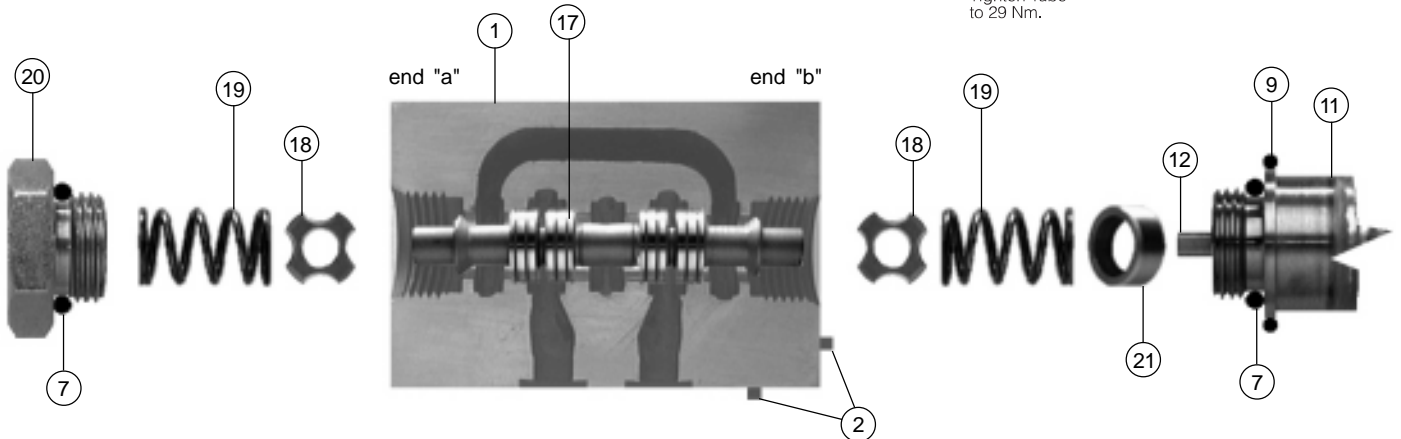
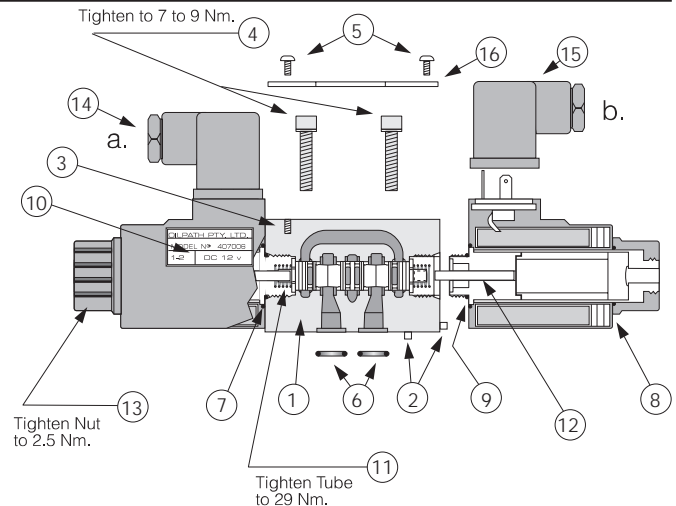


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A3

It applies to valves with the following ordering codes:

1. OP3 - S - A1 - 2SB - N - 1 - DC12
2. OP3 - S - A1 - 2SB - N - 1 - DC24
3. OP3 - S - A1 - 2SB - N - 1 - AC24
4. OP3 - S - A1 - 2SB - N - 1 - AC110
5. OP3 - S - A1 - 2SB - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "a" and tighten to 29 N.m.
9. Then screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **11**

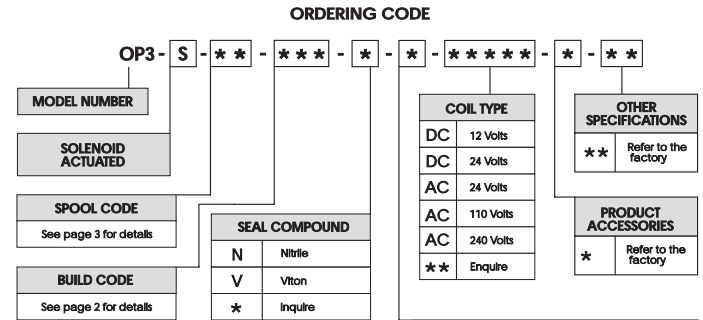
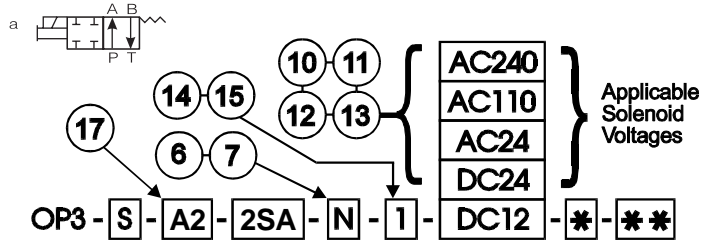
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A4**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420033	1	Push pin, 30.7mm long
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421020	1	Identification plate
17.	249021	1	Spool type A2
18.	251014	1	Offset washer 3.3mm
19.	416039	1	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	246018	1	Offset sleeve (counterbore 3.3mm)
22.	416042	1	Memory spring 1.25 dia x 6.5mm



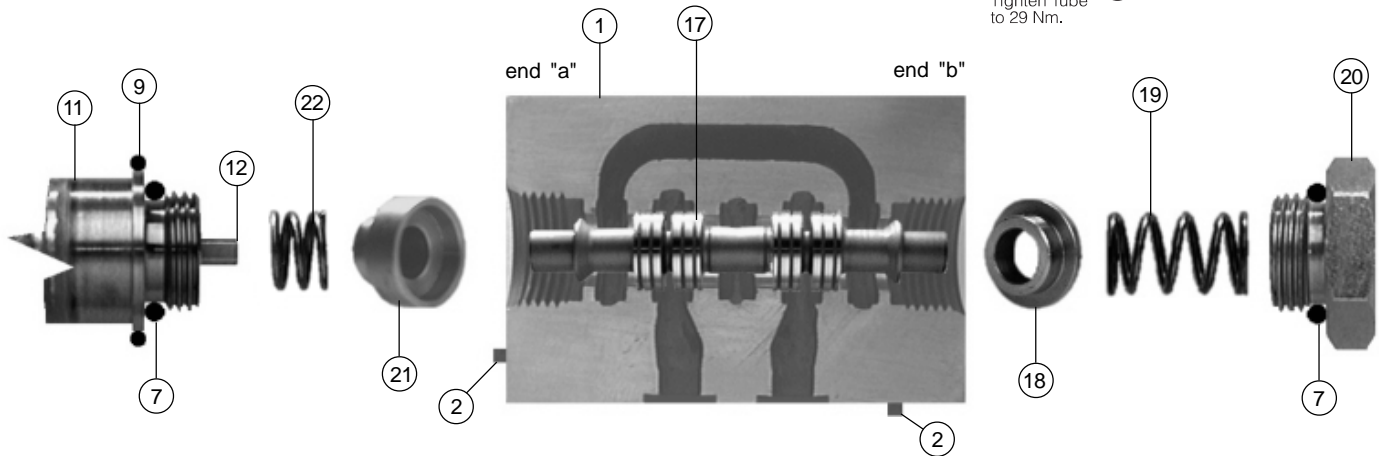
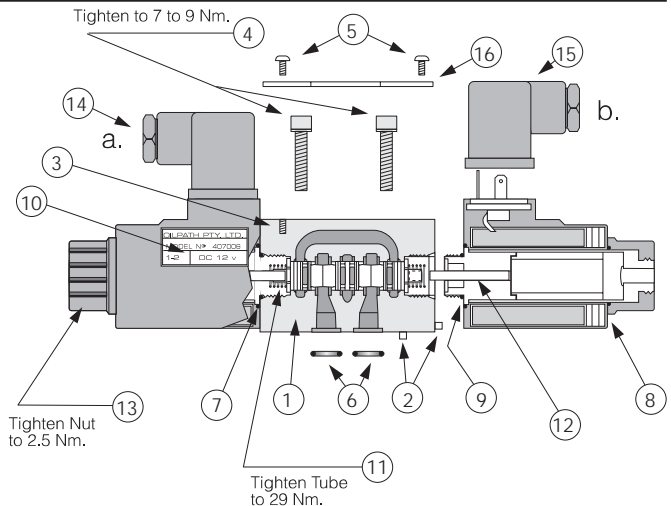
#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

<b>COIL TYPE</b>	DC 12 Volts	<b>OTHER SPECIFICATIONS</b>	** Refer to the factory
	DC 24 Volts		
	AC 24 Volts	<b>PRODUCT ACCESSORIES</b>	* Refer to the factory
	AC 110 Volts		
	AC 240 Volts		
	** Enquire		

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

Manufactured by :

**OILPATH PTY. LTD.**  
A.C.N. 007 683 472  
Incorporated in South Australia

21 Deloraine Road,  
Edwardstown, South Australia 5039

Ph: (08) 2774933 Fax: (08) 2779126

#### WARNING !

Incorrect selection and or improper assembly of the components in this literature can result in damage to property or personal injury. All care should be taken when assembling the hydraulic valve. Please contact your nearest Oilpath distributor or the factory direct if clarification on the assembly of a valve is required.

**OILPATH PTY LTD RESERVE THE RIGHT TO CHANGE SPECIFICATIONS, OR TO DISCONTINUE ANY PRODUCTS LISTED IN THIS DOCUMENT WITHOUT NOTICE.**

#### WARRANTY

Oilpath products are warranted to be free of defects in material or workmanship. This warranty voids all other warranties, whether expressed or implied, and shall be in effect for 6 months from date of purchase. The warranty is limited to replacement or repair, excluding seals or damage arising from misuse or incorrect installation. The company accepts no liability for faults caused by improper use or faulty maintenance of the product, or operation beyond recommended specifications, or contingent or consequential loss or damage under any situation whatsoever. All unauthorised modifications to the product automatically voids the conditions of this warranty.

## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A4

It applies to valves with the following ordering codes:

1. OP3 - S - A2 - 2SA - N - 1 - DC12
2. OP3 - S - A2 - 2SA - N - 1 - DC24
3. OP3 - S - A2 - 2SA - N - 1 - AC24
4. OP3 - S - A2 - 2SA - N - 1 - AC110

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the offset washer item No. 18 onto the spool on end "b".
5. Place the spring item No. 19 into the counterbore of the end plug item No. 20.
6. Then screw the end plug into the valve body on end "b" and tighten to 29 N.m.
7. Check that the push pin item No. 12 is in place. Note (the length is 30.7mm)
8. Place the spring item No. 22 into the counterbore of the tube item No. 11.
9. Place the offset sleeve item No. 21 up against the spring in the counterbore.
10. Then screw the tube into the valve body on end "a" and tighten to 29 N.m.
11. Check that the pin item No. 2 is in the appropriate hole position on end "a".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.



## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A5

It applies to valves with the following ordering codes:

1. OP3 - S - A2 - 2SB - N - 1 - DC12
2. OP3 - S - A2 - 2SB - N - 1 - DC24
3. OP3 - S - A2 - 2SB - N - 1 - AC24
4. OP3 - S - A2 - 2SB - N - 1 - AC110

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the offset washer item No. 18 onto the spool on end "a".
5. Place the spring item No. 19 into the counterbore of the end plug item No. 20.
6. Then screw the end plug into the valve body on end "a" and tighten to 29 N.m.
7. Check that the push pin item No. 12 is in place. Note (the length is 30.7mm).
8. Place the spring item No. 22 into the counterbore of the tube item No. 11.
9. Place the offset sleeve item No. 21 up against the spring in the counterbore.
10. Then screw the tube into the valve body on end "b" and tighten to 29 N.m.
11. Check that the pin item No. 2 is in the appropriate hole position on end "b".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **15**

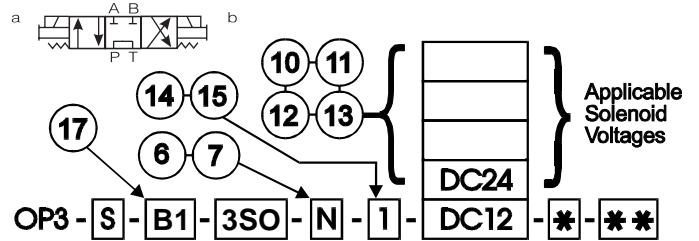
Revision Level **A**

Issue Date **20-1-94**

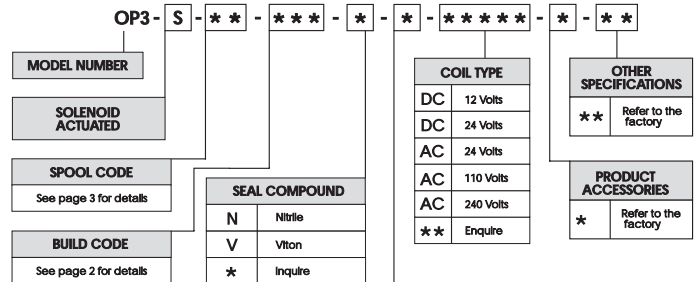
### ASSEMBLY SHEET No. **A6**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
			Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421004	1	Identification plate
17.	249023	1	Spool type B1
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	2	Spring spacers
21.			
22.			



#### ORDERING CODE

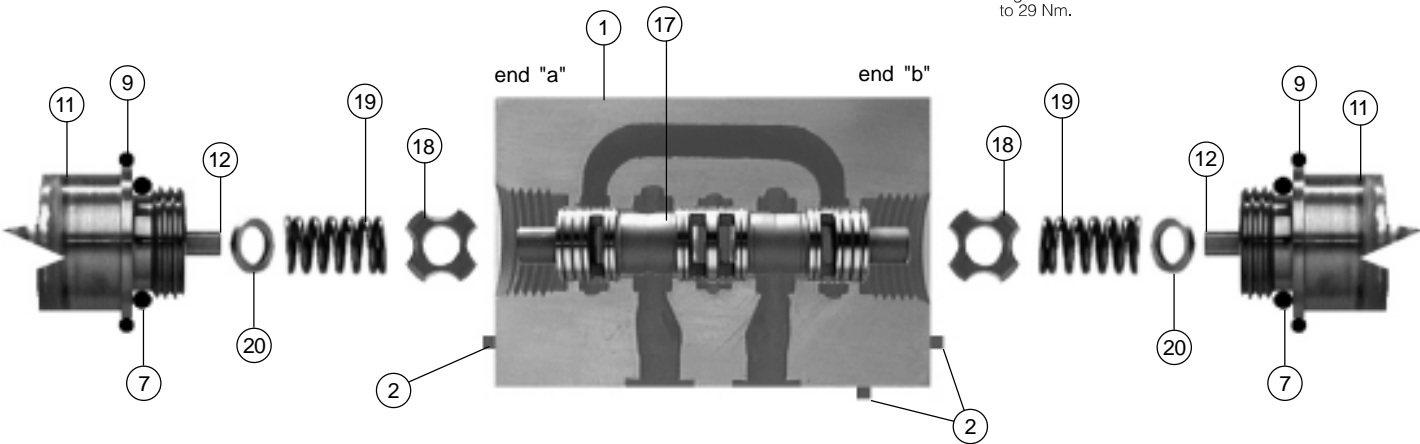
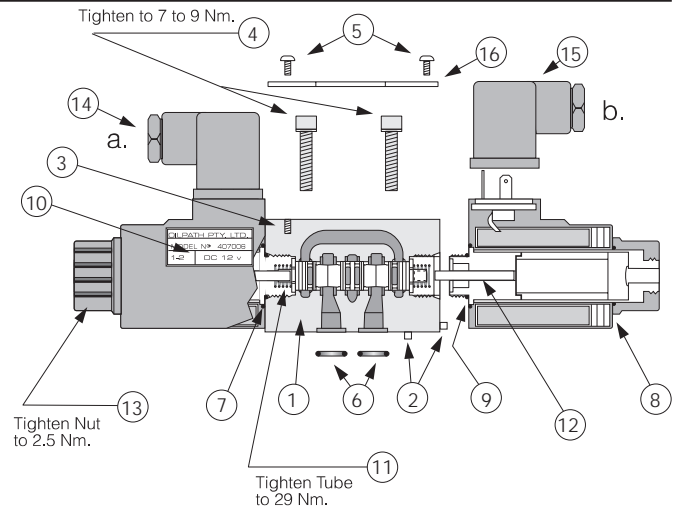


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia  
 21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

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#### WARRANTY

Oilpath products are warranted to be free of defects in material or workmanship. This warranty voids all other warranties, whether expressed or implied, and shall be in effect for 6 months from date of purchase. The warranty is limited to replacement or repair, excluding seals or damage arising from misuse or incorrect installation. The company accepts no liability for faults caused by improper use or faulty maintenance of the product, or operation beyond recommended specifications, or contingent or consequential loss or damage under any situation whatsoever. All unauthorised modifications to the product automatically voids the conditions of this warranty.

### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A6

It applies to valves with the following ordering codes:

1. OP3 - S - B1 - 3SO - N - 1 - DC12
2. OP3 - S - B1 - 3SO - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Place the spring spacers item No. 20 into the counter bores of the tubes item No. 11.
7. Put the springs item No. 19 into the tube counterbores against the spring spacers.
8. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
9. Check that the pins item No. 2 are in the appropriate hole positions.
10. Place the "O" rings item No. 9 onto the tubes against the valve body.
11. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
12. Put the "O" rings item No. 8 onto the tubes and against the coils.
13. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
14. Make sure that the coils fit flat and tight against the valve body end face.
15. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
16. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.



## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A7

It applies to valves with the following ordering codes:

1. OP3 - S - B1 - 3SO - N - 1 - AC24
2. OP3 - S - B1 - 3SO - N - 1 - AC110
3. OP3 - S - B1 - 3SO - N - 1 - AC240
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the tube counterbores item No. 11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
15. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **19**

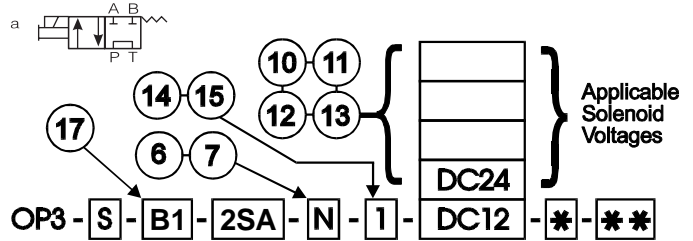
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A8**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
			Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421005	1	Identification plate
17.	249023	1	Spool type B1
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	1	Spring spacer
21.	240022	1	End plug
22.	251011	1	Stop washer 4mm long



#### ORDERING CODE

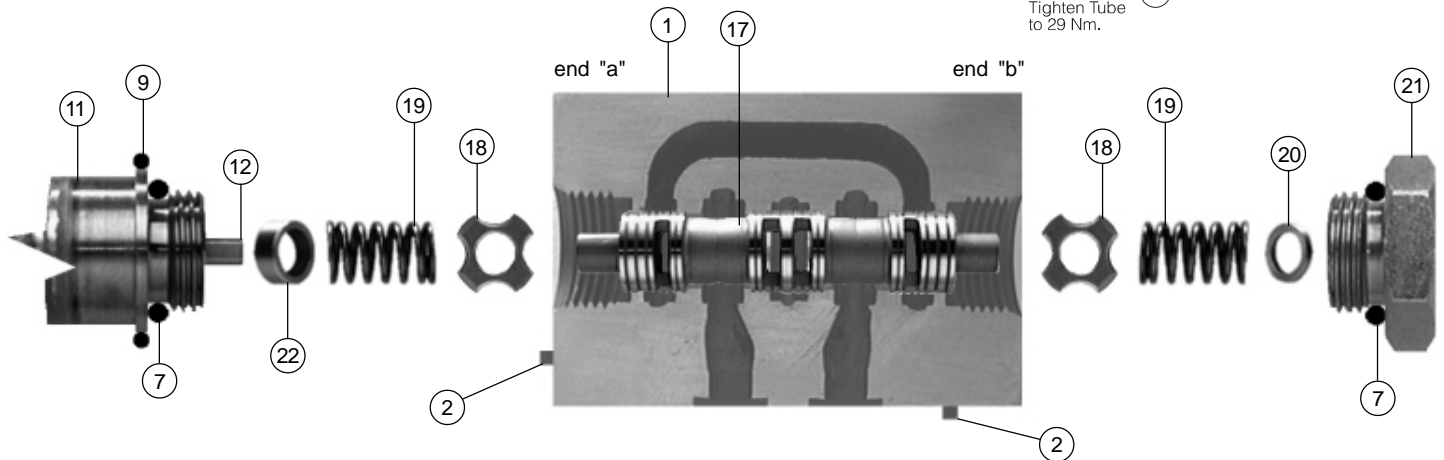
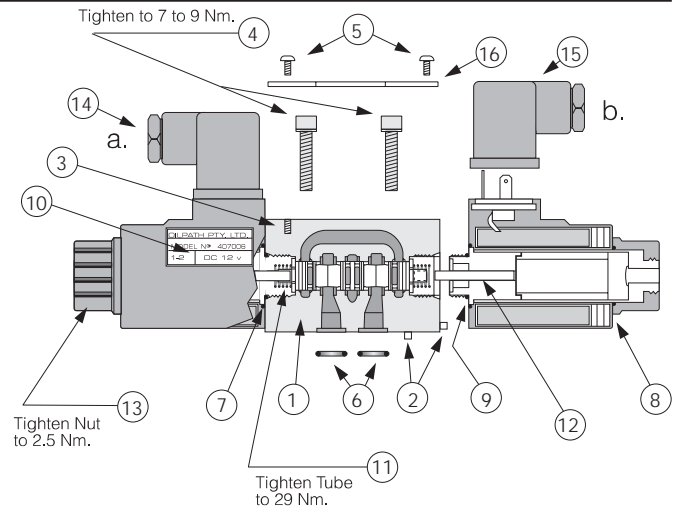
<b>MODEL NUMBER</b>	OP3 - S - * * * - * * * - * - * * * * * - * - * *
<b>SOLENOID ACTUATED</b>	DC 12 Volts
<b>SPOOL CODE</b>	See page 3 for details
<b>BUILD CODE</b>	See page 2 for details
<b>SEAL COMPOUND</b>	N Nitrile V Viton * Inquire
<b>COIL TYPE</b>	DC 12 Volts DC 24 Volts AC 24 Volts AC 110 Volts AC 240 Volts * * Enquire
<b>OTHER SPECIFICATIONS</b>	* * Refer to the factory
<b>PRODUCT ACCESSORIES</b>	* Refer to the factory

#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM L 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia  
 21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A8

It applies to valves with the following ordering codes:

1. OP3 - S - B1 - 2SA - N - 1 - DC12
2. OP3 - S - B1 - 2SA - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the spring spacers item No. 20 into the counterbore of the end plug item No. 21.
7. Place the stop washer item No. 22 into the counterbore of the tube item No. 11.
8. Put the springs item No. 19 into the tube counterbores of the tube and end plug.
9. Screw the end plug into the valve body on end "b" and tighten to 29 N.m.
10. Screw the tube into the valve body on end "a" and tighten to 29 N.m
11. Check that the pin item No. 2 is in the appropriate hole position on end "a".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **21**

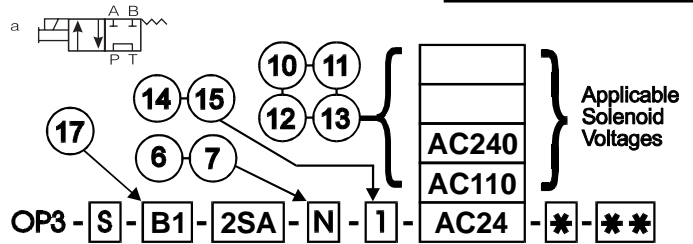
Revision Level **A**

Issue Date **20-1-94**

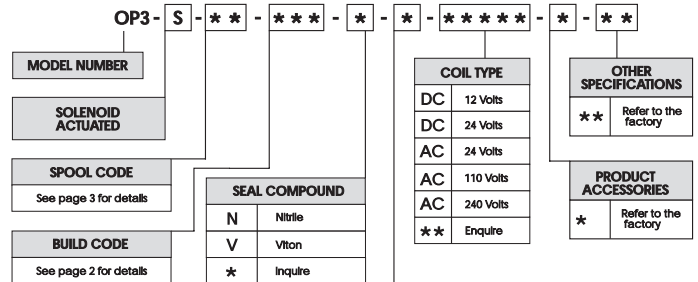
### ASSEMBLY SHEET No. **A9**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421005	1	Identification plate
17.	249023	1	Spool type B1
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

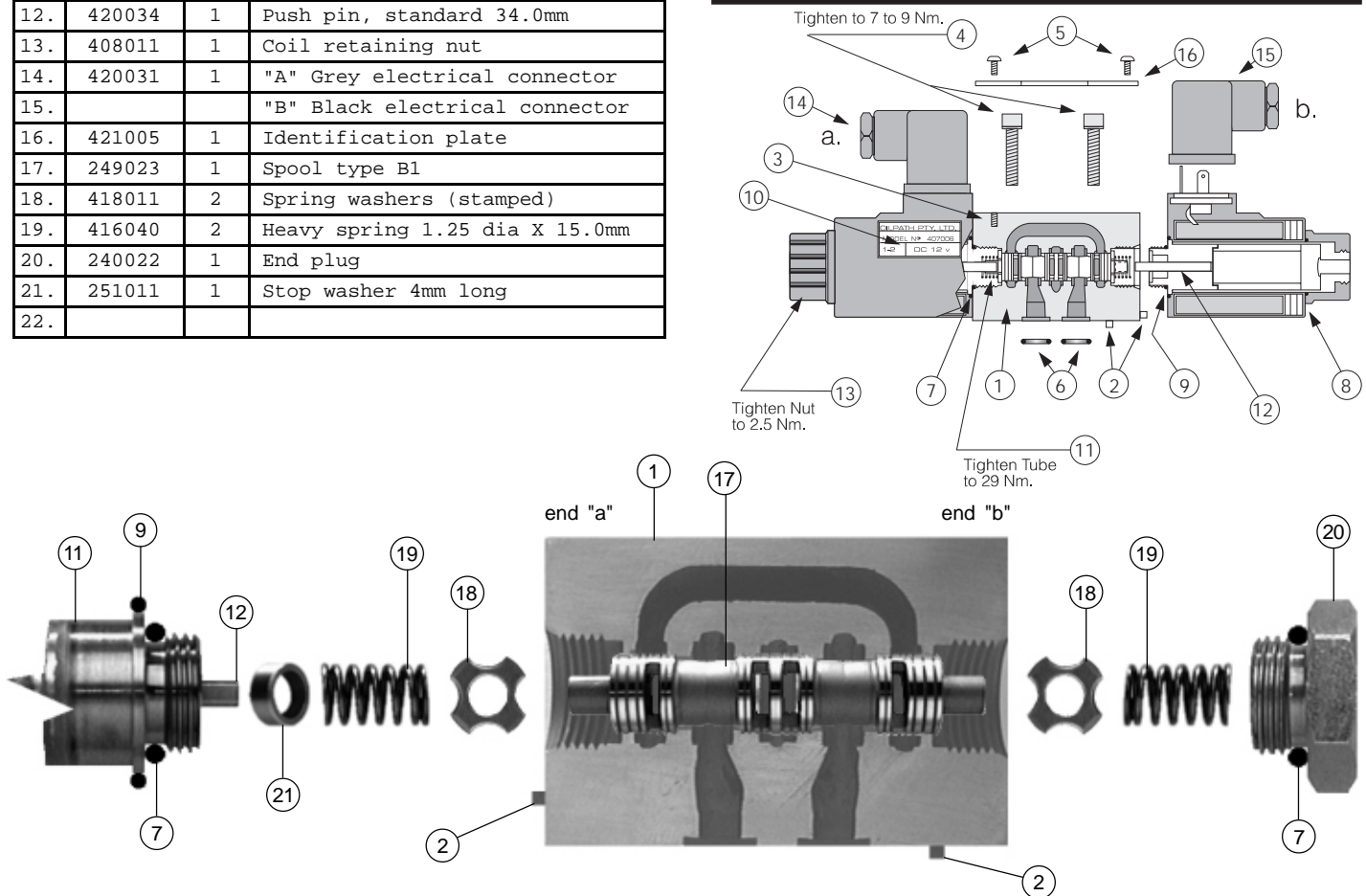


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :

**OILPATH PTY. LTD.**  
A.C.N. 007 683 472  
Incorporated in South Australia

21 Deloraine Road,  
Edwardstown, South Australia 5039

Ph: (08) 2774933 Fax: (08) 2779126

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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A9

It applies to valves with the following ordering codes:

1. OP3 - S - B1 - 2SA - N - 1 - AC24
2. OP3 - S - B1 - 2SA - N - 1 - AC110
3. OP3 - S - B1 - 2SA - N - 1 - AC240
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 in to the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Screw the end plug into the valve body on end "b" and tighten to 29 N.m.
9. Screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure they locate onto the pin and sit tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coils fit flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **23**

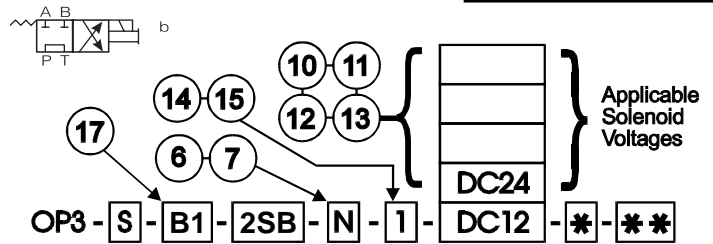
Revision Level **A**

Issue Date **20-1-94**

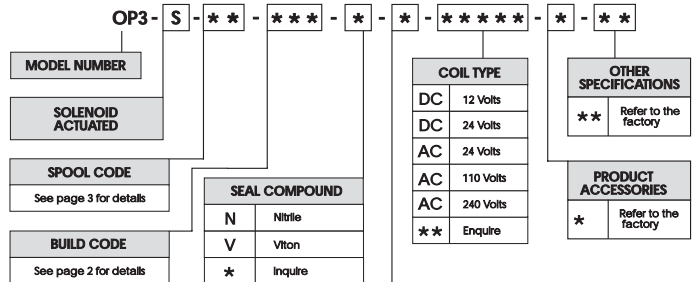
### ASSEMBLY SHEET No. **A10**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
			Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421006	1	Identification plate
17.	249023	1	Spool type B1
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	1	Spring spacer
21.	240022	1	End plug
22.	251011	1	Stop washer 4mm long



#### ORDERING CODE

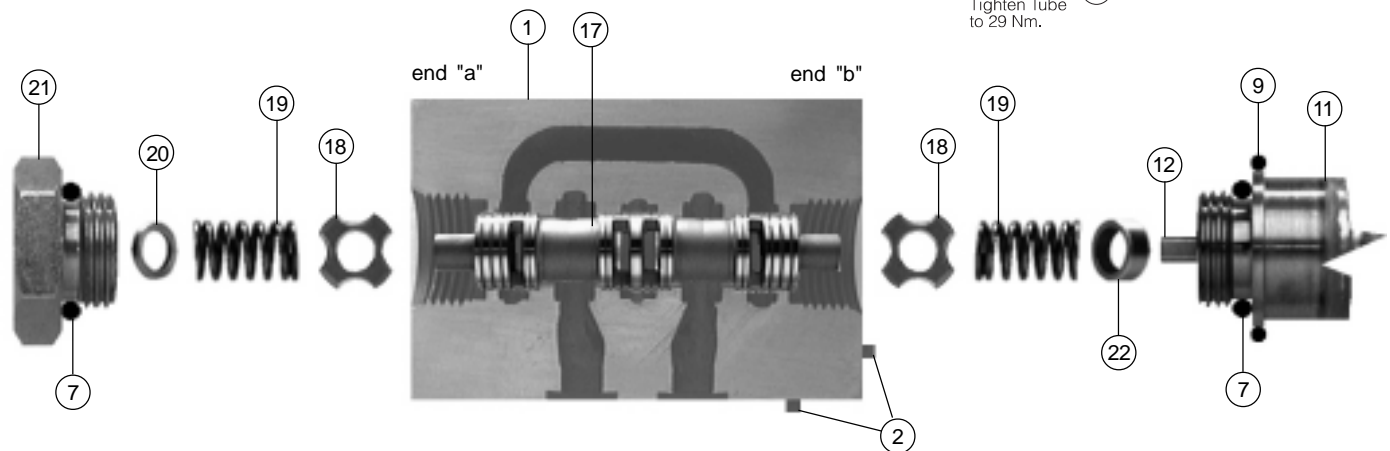
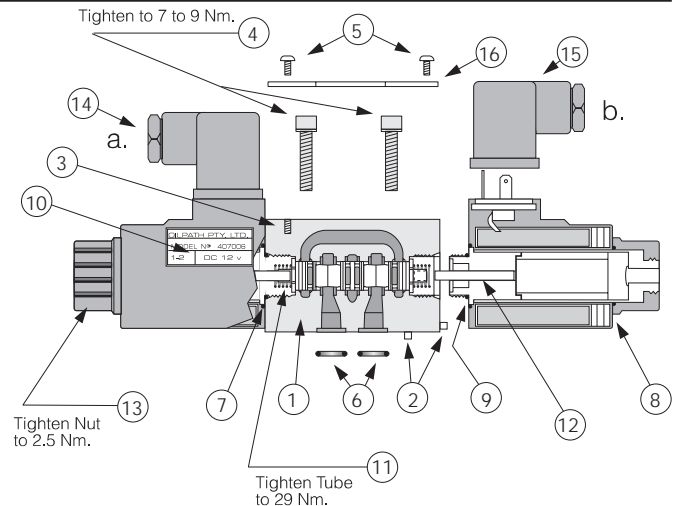


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM L 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
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 A.C.N. 007 683 472  
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 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. **A10**

It applies to valves with the following ordering codes:

1. OP3 - S - B1 - 2SB - N - 1 - DC12
2. OP3 - S - B1 - 2SB - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the spring spacer item No. 20 into the counterbore of the end plug item No. 21.
7. Place the stop washer item No. 22 into the counterbore of the tube item No. 11.
8. Put the springs item No. 19 into the counterbores of the tube and end plug.
9. Screw the end plug into the valve body on end "a" and tighten to 29 N.m.
10. Screw the tube into the valve body on end "b" and tighten to 29 N.m
11. Check that the pin item No. 2 is in the appropriate hole position on end "b".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **25**

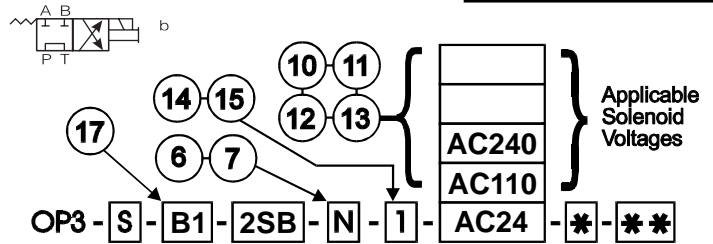
Revision Level **A**

Issue Date **20-1-94**

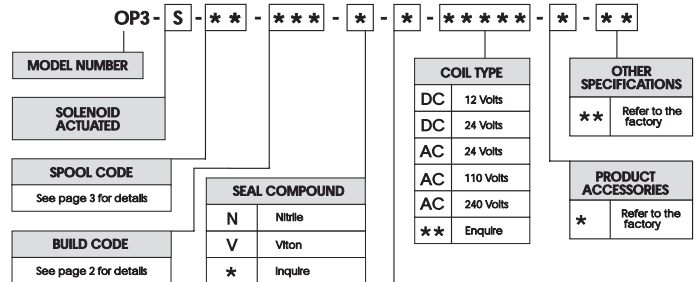
### ASSEMBLY SHEET No. **A11**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421006	1	Identification plate
17.	249023	1	Spool type B1
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

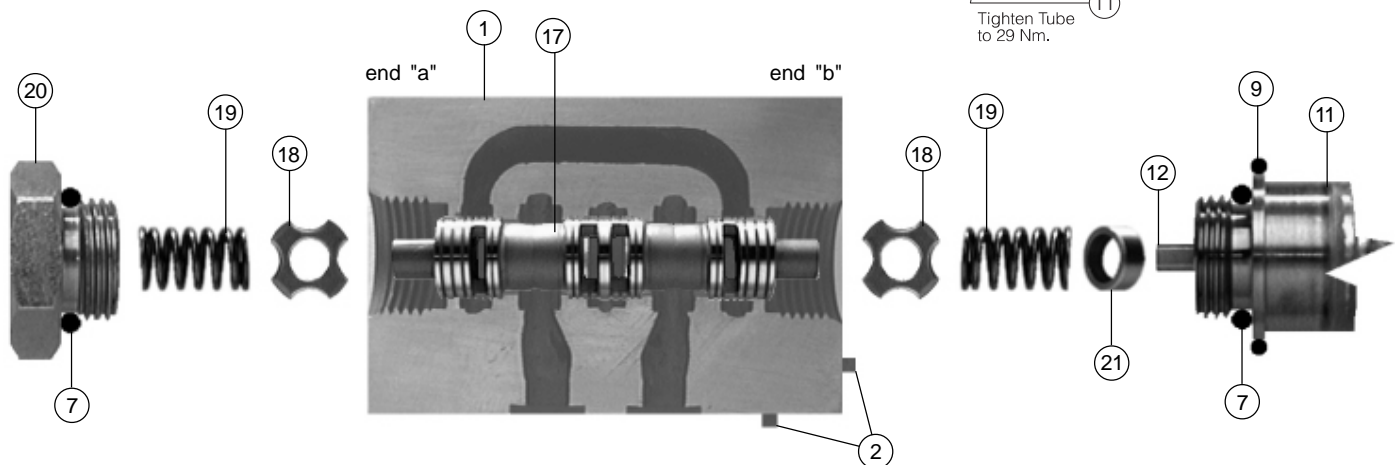
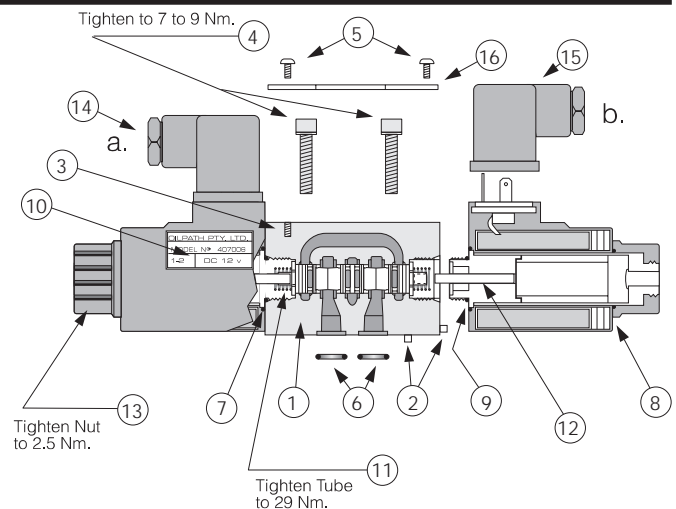


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
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 Ph: (08) 2774933 Fax: (08) 2779126

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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A11

It applies to valves with the following ordering codes:

1. OP3 - S - B1 - 2SB - N - 1 - AC24
2. OP3 - S - B1 - 2SB - N - 1 - AC110
3. OP3 - S - B1 - 2SB - N - 1 - AC240
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Screw the end plug into the valve body on end "a" and tighten to 29 N.m.
9. Screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure they locate onto the pin and sit tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coils fit flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. 27

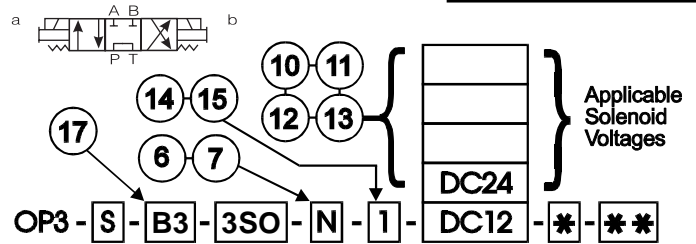
Revision Level A

Issue Date 20-1-94

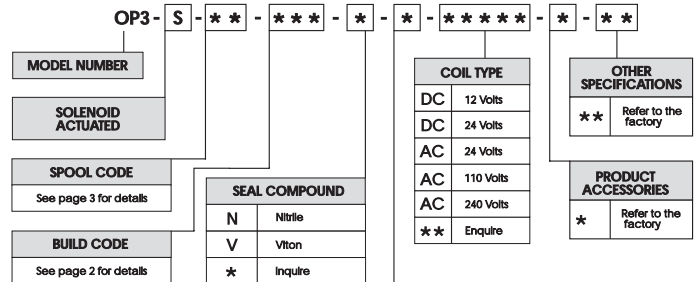
### ASSEMBLY SHEET No. A12

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
			Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421004	1	Identification plate
17.	249025	1	Spool type B3
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	2	Spring spacers
21.			
22.			



#### ORDERING CODE

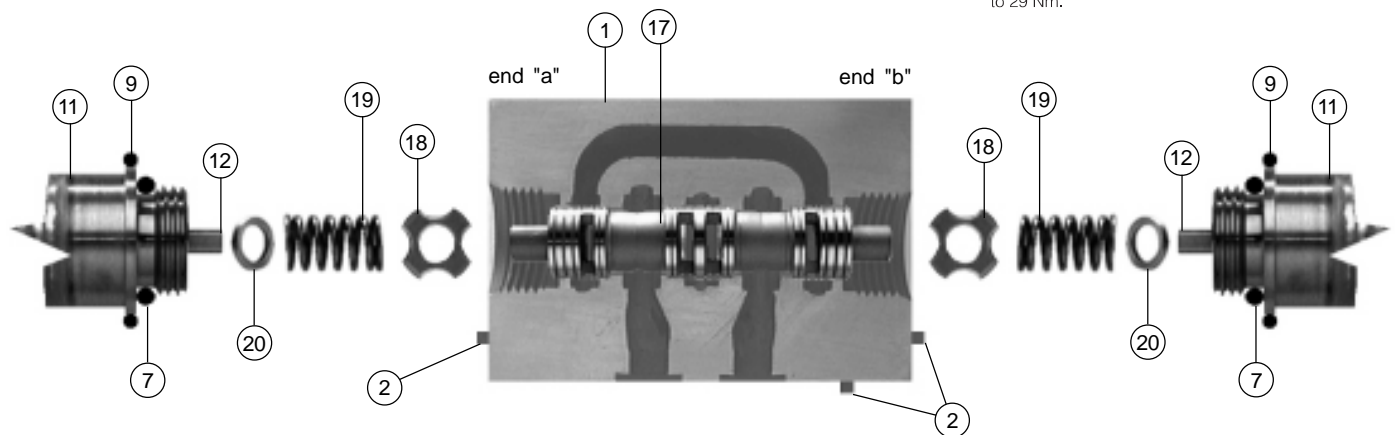
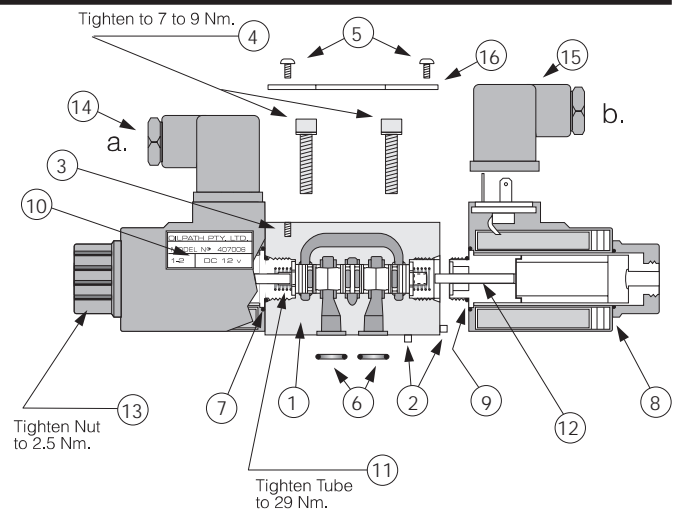


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. **A12**

It applies to valves with the following ordering codes:

1. OP3 - S - B3 - 3SO - N - 1 - DC12
2. OP3 - S - B3 - 3SO - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Place the spring spacers item No. 20 into the counterbores of the tubes item No. 11.
7. Put the springs item No. 19 into the tube counterbores against the spring spacers.
8. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
9. Check that the pins item No. 2 are in the appropriate hole positions.
10. Place the "O" rings item No. 9 onto the tubes against the valve body.
11. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
12. Put the "O" rings item No. 8 onto the tubes and against the coils.
13. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
14. Make sure that the coils fit flat and tight against the valve body end face.
15. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
16. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **29**

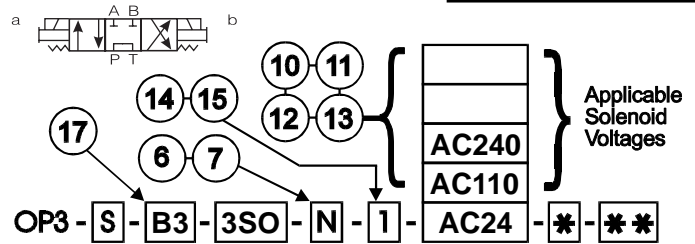
Revision Level **A**

Issue Date **20-1-94**

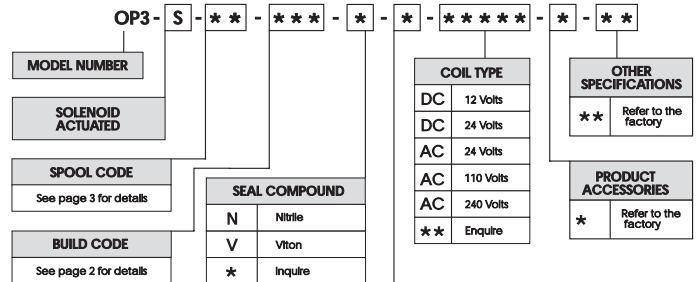
### ASSEMBLY SHEET No. **A13**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421004	1	Identification plate
17.	249025	1	Spool type B3
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.			
21.			
22.			



#### ORDERING CODE

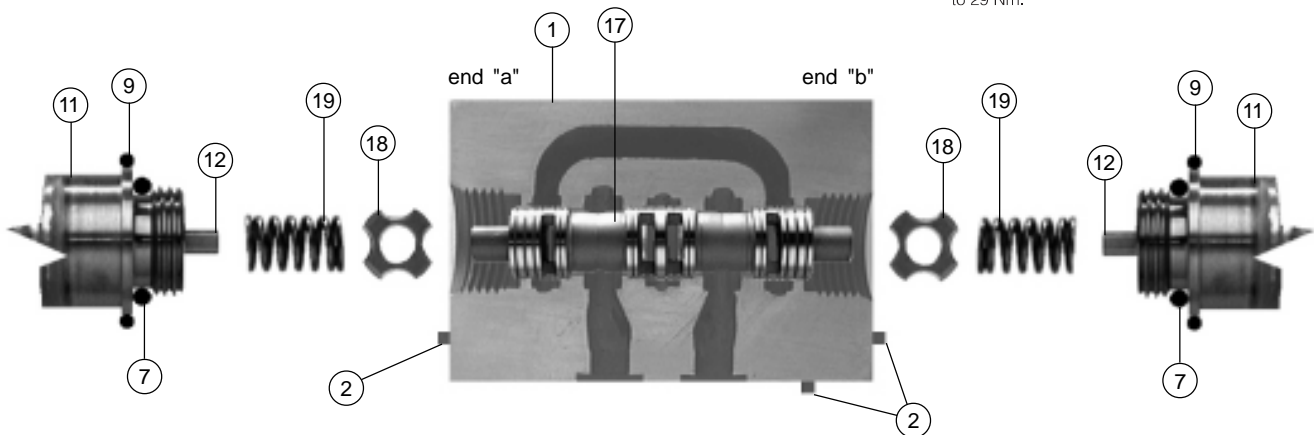
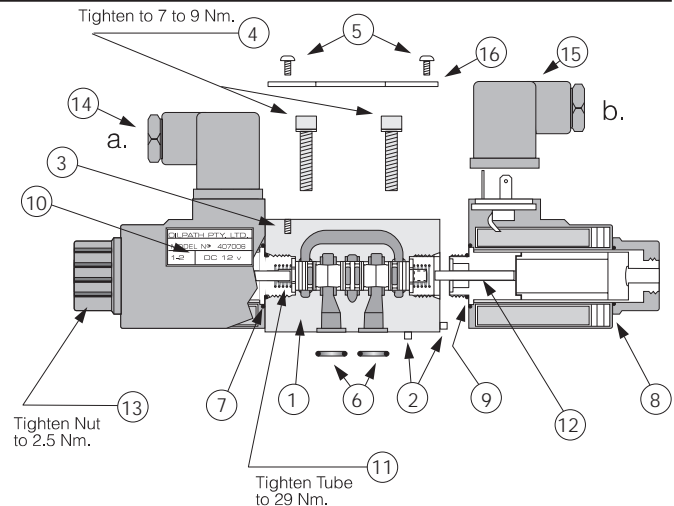


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia

21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A13

It applies to valves with the following ordering codes:

1. OP3 - S - B3 - 3SO - N - 1 - AC24
2. OP3 - S - B3 - 3SO - N - 1 - AC110
3. OP3 - S - B3 - 3SO - N - 1 - AC240
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the tube counterbores item No. 11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
16. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **31**

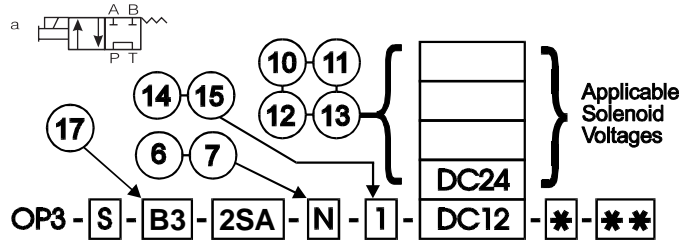
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A14**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
			Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421005	1	Identification plate
17.	249025	1	Spool type B3
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	1	Spring spacer
21.	240022	1	End plug
22.	251011	1	Stop washer 4mm long



#### ORDERING CODE

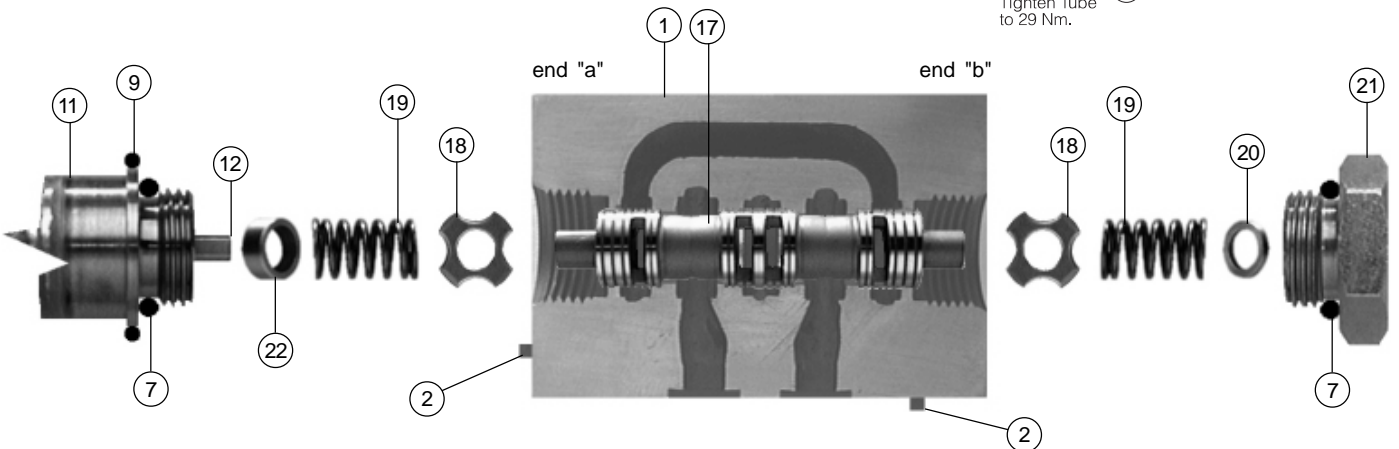
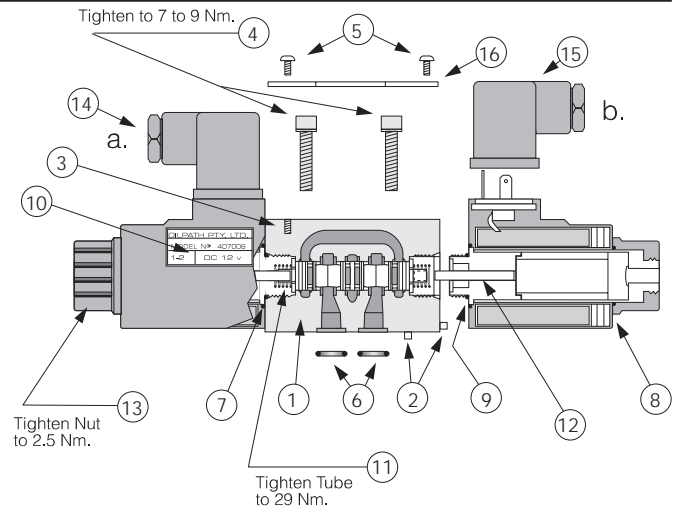
<b>MODEL NUMBER</b>	OP3 - S - * * * - * * * - * - * * * * * - * - * *
<b>SOLENOID ACTUATED</b>	DC 12 Volts
<b>SPOOL CODE</b>	B3
<b>BUILD CODE</b>	N
<b>SEAL COMPOUND</b>	Nitrile
<b>COIL TYPE</b>	DC 24 Volts
<b>OTHER SPECIFICATIONS</b>	** Refer to the factory
<b>PRODUCT ACCESSORIES</b>	* Refer to the factory

#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

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 Ph: (08) 2774933 Fax: (08) 2779126

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A14

It applies to valves with the following ordering codes:

1. OP3 - S - B3 - 2SA - N - 1 - DC12
2. OP3 - S - B3 - 2SA - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the spring spacer item No. 20 into the counter bore of the end plug item No. 21.
7. Place the stop washer item No. 22 into the counterbore of the tube item No. 11.
8. Put the springs item No. 19 into the counterbores of the tube and end plug.
9. Screw the end plug into the valve body on end "b" and tighten to 29 N.m.
10. Screw the tube into the valve body on end "a" and tighten to 29 N.m
11. Check that the pin item No. 2 is in the appropriate hole position on end "a".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **33**

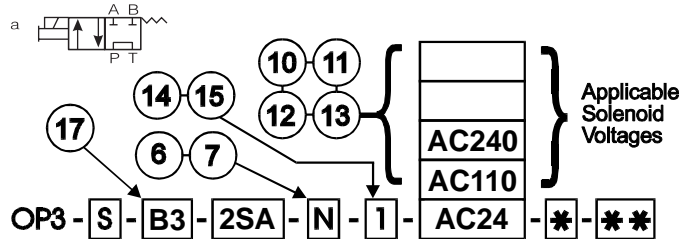
Revision Level **A**

Issue Date **20-1-94**

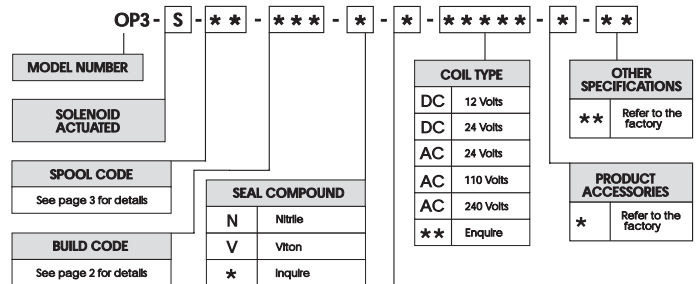
### ASSEMBLY SHEET No. **A15**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421005	1	Identification plate
17.	249025	1	Spool type B3
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

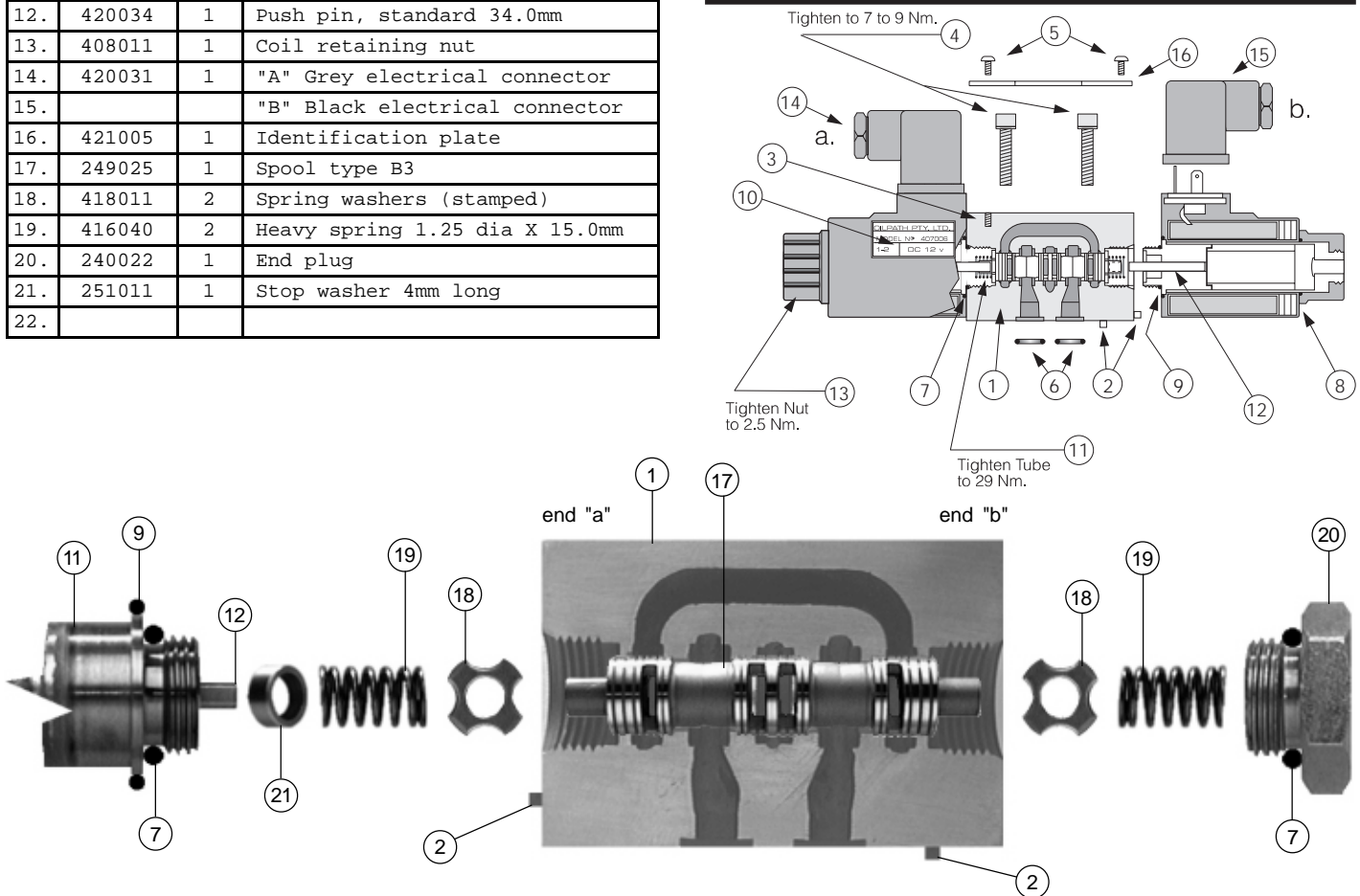


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A15

It applies to valves with the following ordering codes:

1. OP3 - S - B3 - 2SA - N - 1 - AC24
2. OP3 - S - B3 - 2SA - N - 1 - AC110
3. OP3 - S - B3 - 2SA - N - 1 - AC240
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Screw the end plug into the valve body on end "b" and tighten to 29 N.m.
9. Screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure they locate onto the pin and sit tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coils fit flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **35**

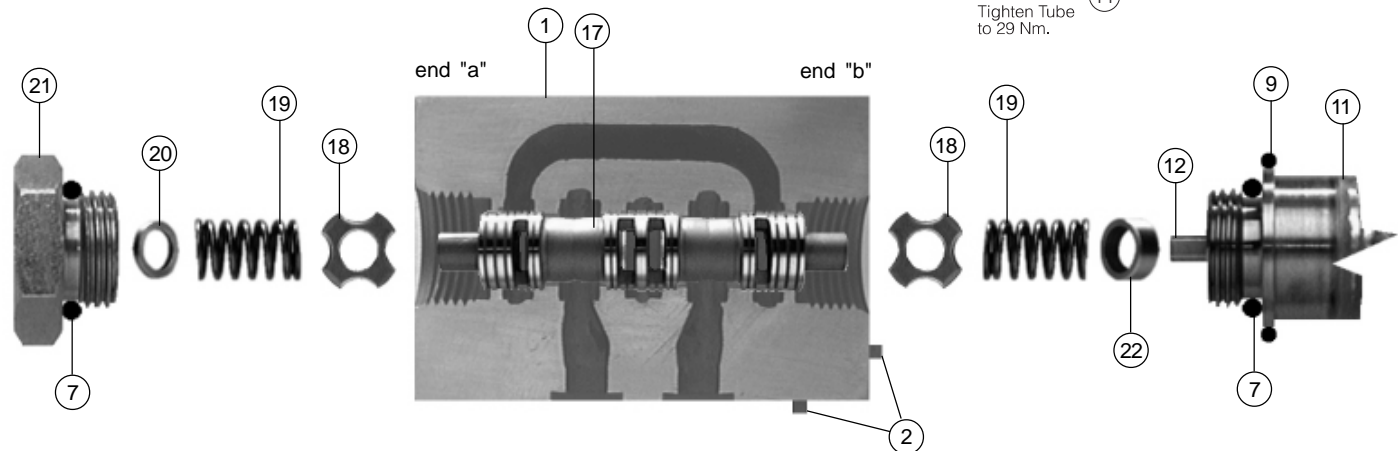
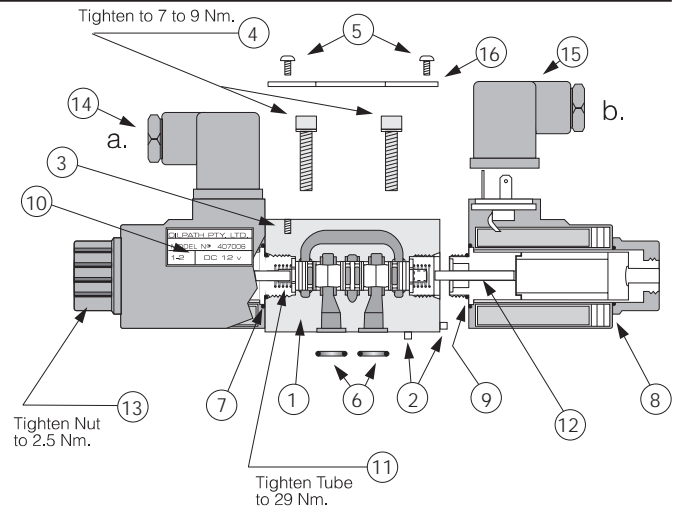
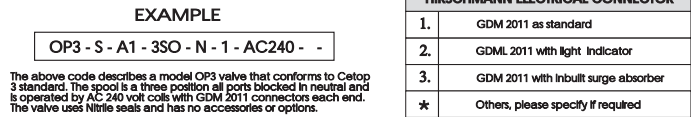
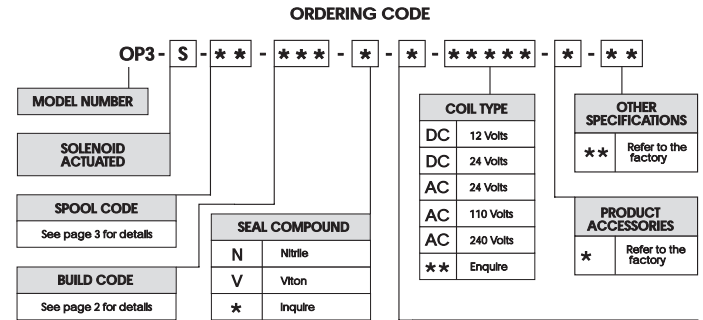
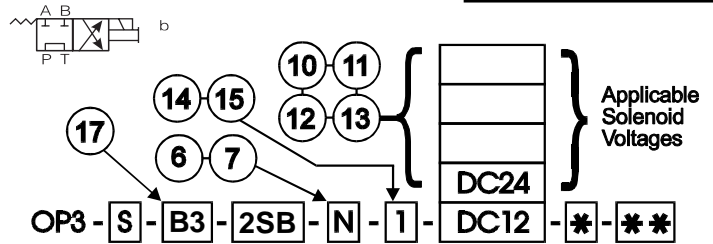
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A16**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
			Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421006	1	Identification plate
17.	249025	1	Spool type B3
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	1	Spring spacer
21.	240022	1	End plug
22.	251011	1	Stop washer 4mm long



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A16

It applies to valves with the following ordering codes:

1. OP3 - S - B3 - 2SB - N - 1 - DC12
2. OP3 - S - B3 - 2SB - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the spring spacer item No. 20 into the counterbore of the end plug item No. 21.
7. Place the stop washer item No. 22 into the counterbore of the tube item No. 11.
8. Put the springs item No. 19 into the counterbores of the tube and end plug.
9. Screw the end plug into the valve body on end "a" and tighten to 29 N.m.
10. Screw the tube into the valve body on end "b" and tighten to 29 N.m
11. Check that the pin item No. 2 is in the appropriate hole position on end "b".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **37**

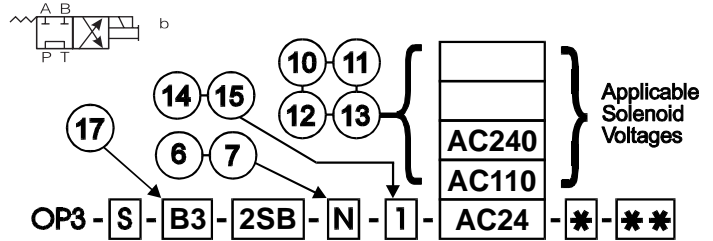
Revision Level **A**

Issue Date **20-1-94**

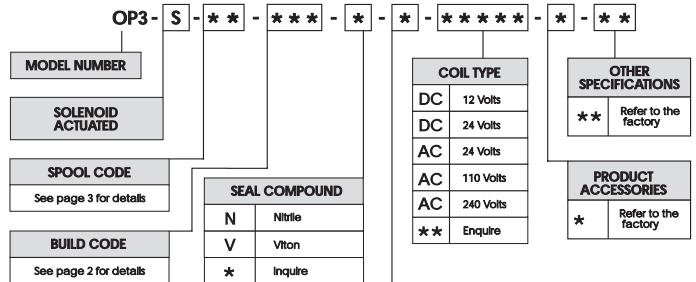
### ASSEMBLY SHEET No. **A17**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421006	1	Identification plate
17.	249025	1	Spool type B3
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

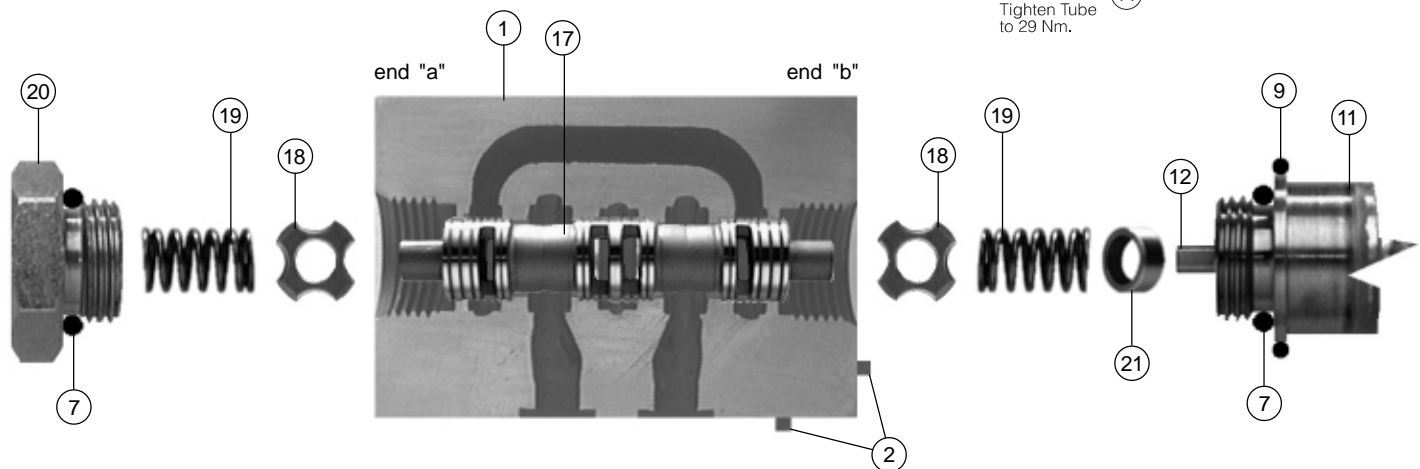
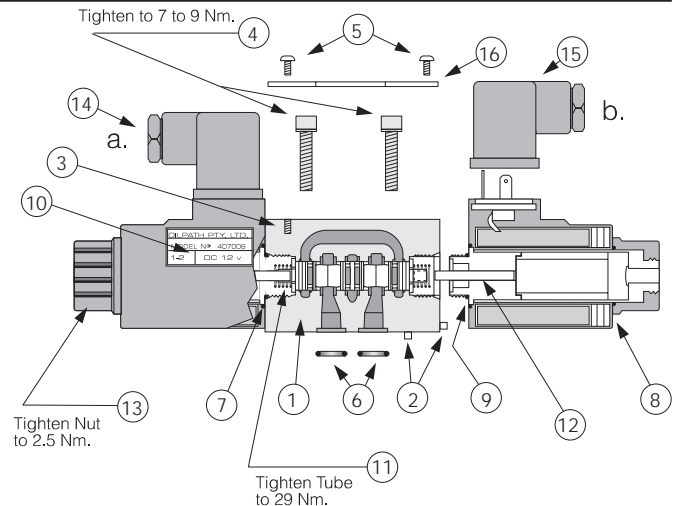


#### EXAMPLE

OP3-S-A1-3SO-N-1-AC240--

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia  
 21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

#### WARNING !

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#### WARRANTY

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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A17

It applies to valves with the following ordering codes:

1. OP3 - S - B3 - 2SB - N - 1 - AC24
2. OP3 - S - B3 - 2SB - N - 1 - AC110
3. OP3 - S - B3 - 2SB - N - 1 - AC240
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Screw the end plug into the valve body on end "a" and tighten to 29 N.m.
9. Screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure they locate onto the pin and sit tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coils fit flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **39**

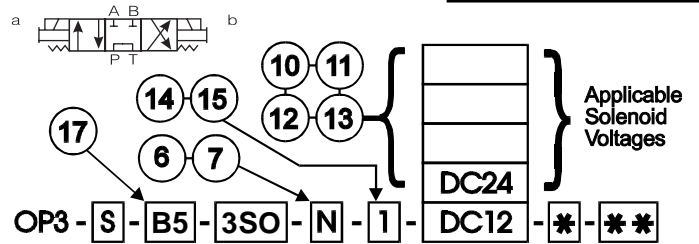
Revision Level **A**

Issue Date **20-1-94**

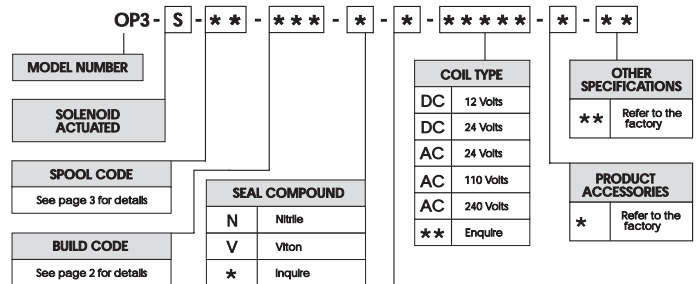
### ASSEMBLY SHEET No. **A18**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
			Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421004	1	Identification plate
17.	249027	1	Spool type B5
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	2	Spring spacers
21.			
22.			



#### ORDERING CODE

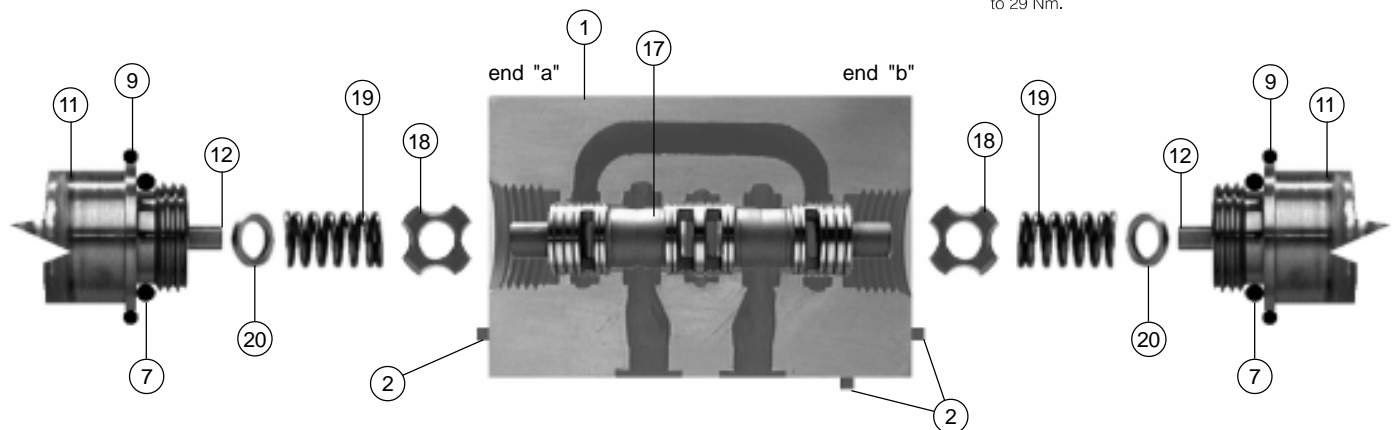
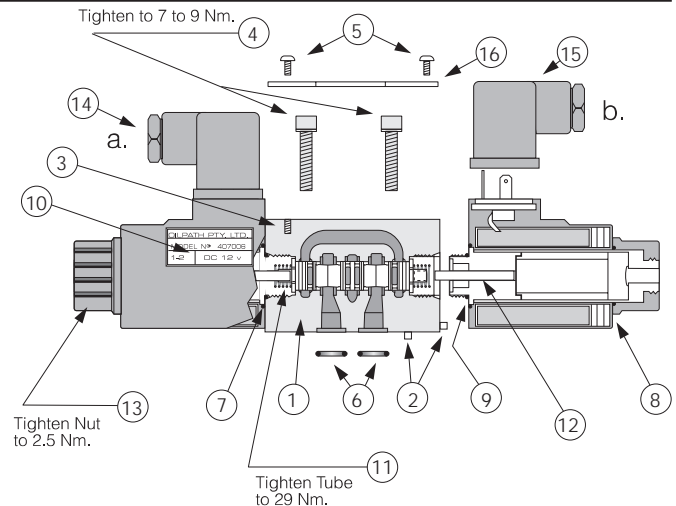


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
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 Edwardstown, South Australia 5039  
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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A18

It applies to valves with the following ordering codes:

1. OP3 - S - B5 - 3SO - N - 1 - DC12
2. OP3 - S - B5 - 3SO - N - 1 - DC24
- 3.
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Place the spring spacers item No. 20 into the counterbores of the tubes item No. 11.
7. Put the springs item No. 19 into the tube counterbores against the spring spacers.
8. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
9. Check that the pins item No. 2 are in the appropriate hole positions.
10. Place the "O" rings item No. 9 onto the tubes against the valve body.
11. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
12. Put the "O" rings item No. 8 onto the tubes and against the coils.
13. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
14. Make sure that the coils fit flat and tight against the valve body end face.
15. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
16. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **41**

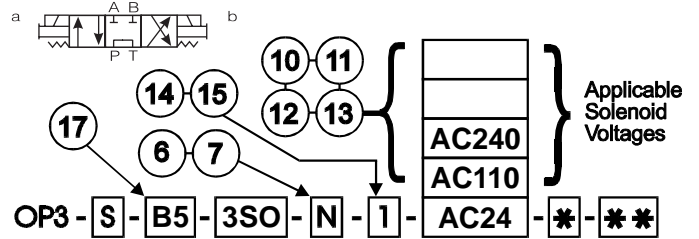
Revision Level **A**

Issue Date **20-1-94**

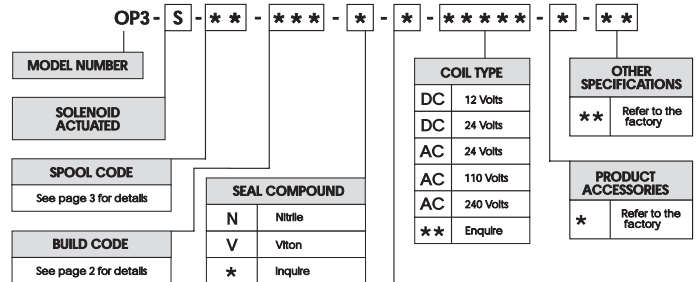
### ASSEMBLY SHEET No. **A19**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421004	1	Identification plate
17.	249027	1	Spool type B5
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.			
21.			
22.			



#### ORDERING CODE

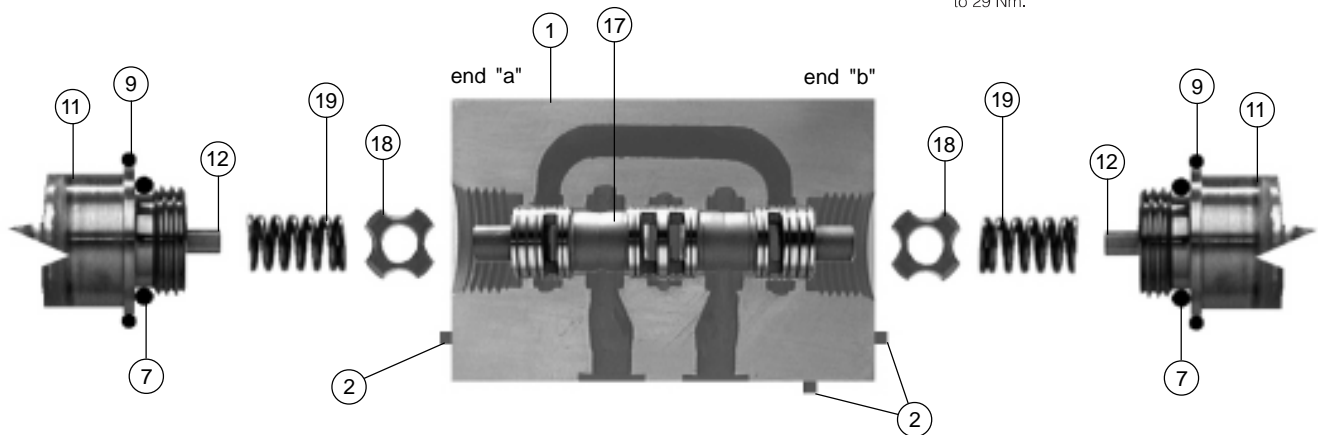
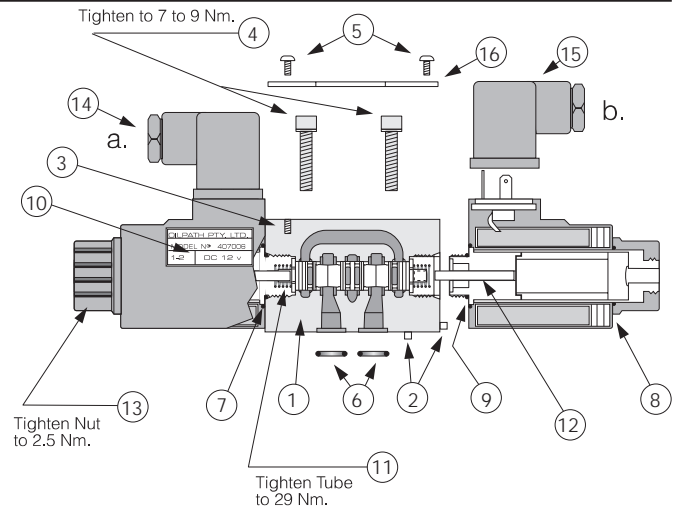


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM L 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. **A19**

It applies to valves with the following ordering codes:

1. OP3 - S - B5 - 3SO - N - 1 - AC24
2. OP3 - S - B5 - 3SO - N - 1 - AC110
3. OP3 - S - B5 - 3SO - N - 1 - AC240
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the tube counterbores item No. 11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
16. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **43**

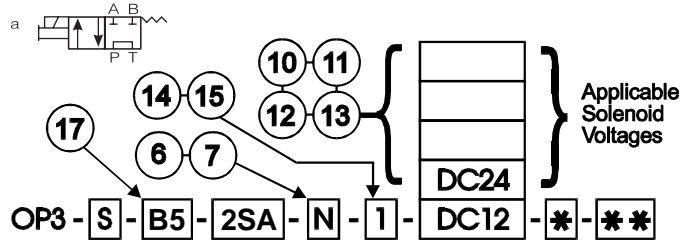
Revision Level **A**

Issue Date **20-1-94**

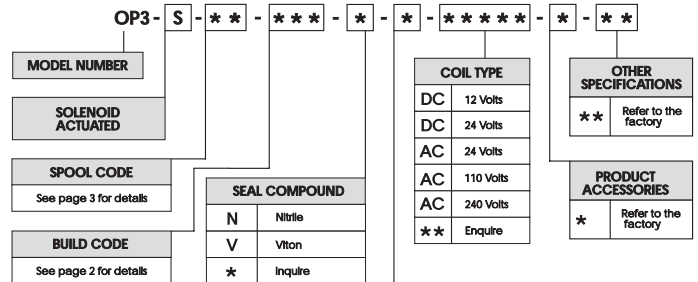
### ASSEMBLY SHEET No. **A20**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
			Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421005	1	Identification plate
17.	249027	1	Spool type B5
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	1	Spring spacer
21.	240022	1	End plug
22.	251011	1	Stop washer 4mm long



#### ORDERING CODE



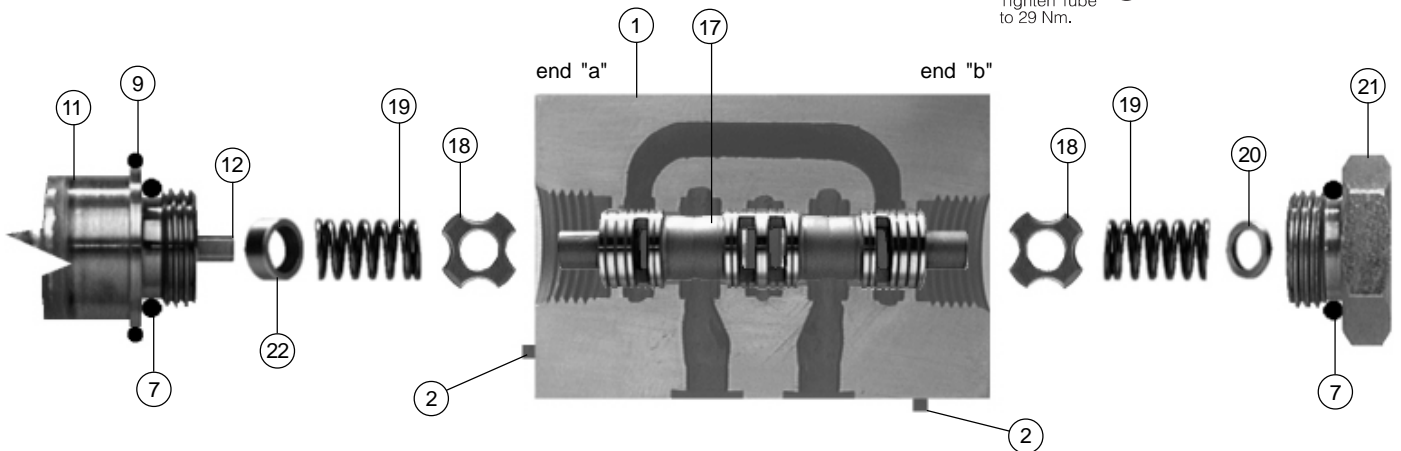
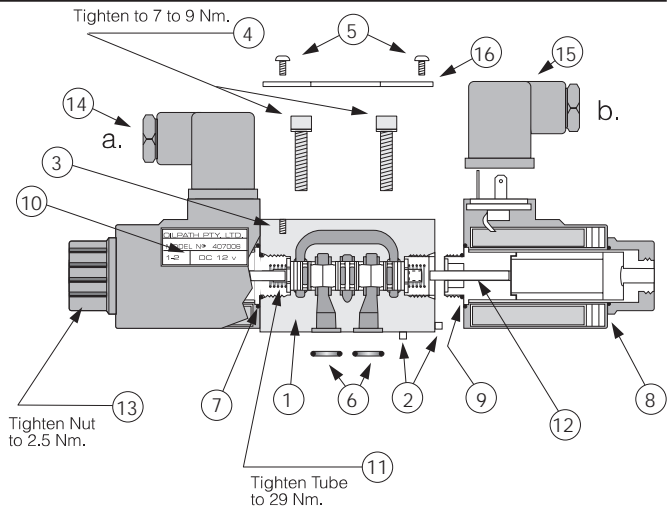
#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A20

It applies to valves with the following ordering codes:

1. OP3 - S - B5 - 2SA - N - 1 - DC12
2. OP3 - S - B5 - 2SA - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the spring spacers item No. 20 into the counterbore of the end plug item No. 21.
7. Place the stop washer item No. 22 into the counterbore of the tube item No. 11.
8. Put the springs item No. 19 into the counterbores of the tube and end plug.
9. Screw the end plug into the valve body on end "b" and tighten to 29 N.m.
10. Screw the tube into the valve body on end "a" and tighten to 29 N.m
11. Check that the pin item No. 2 is in the appropriate hole position on end "a".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **45**

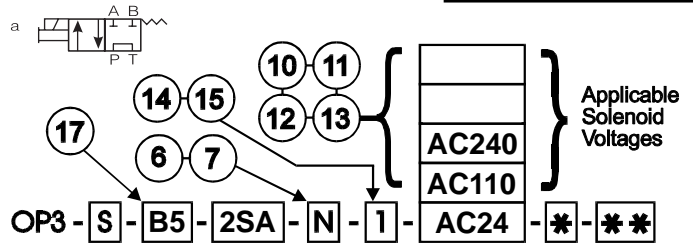
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A21**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.			Coil D.C. 12 Volts
			Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.			Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421005	1	Identification plate
17.	249027	1	Spool type B5
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

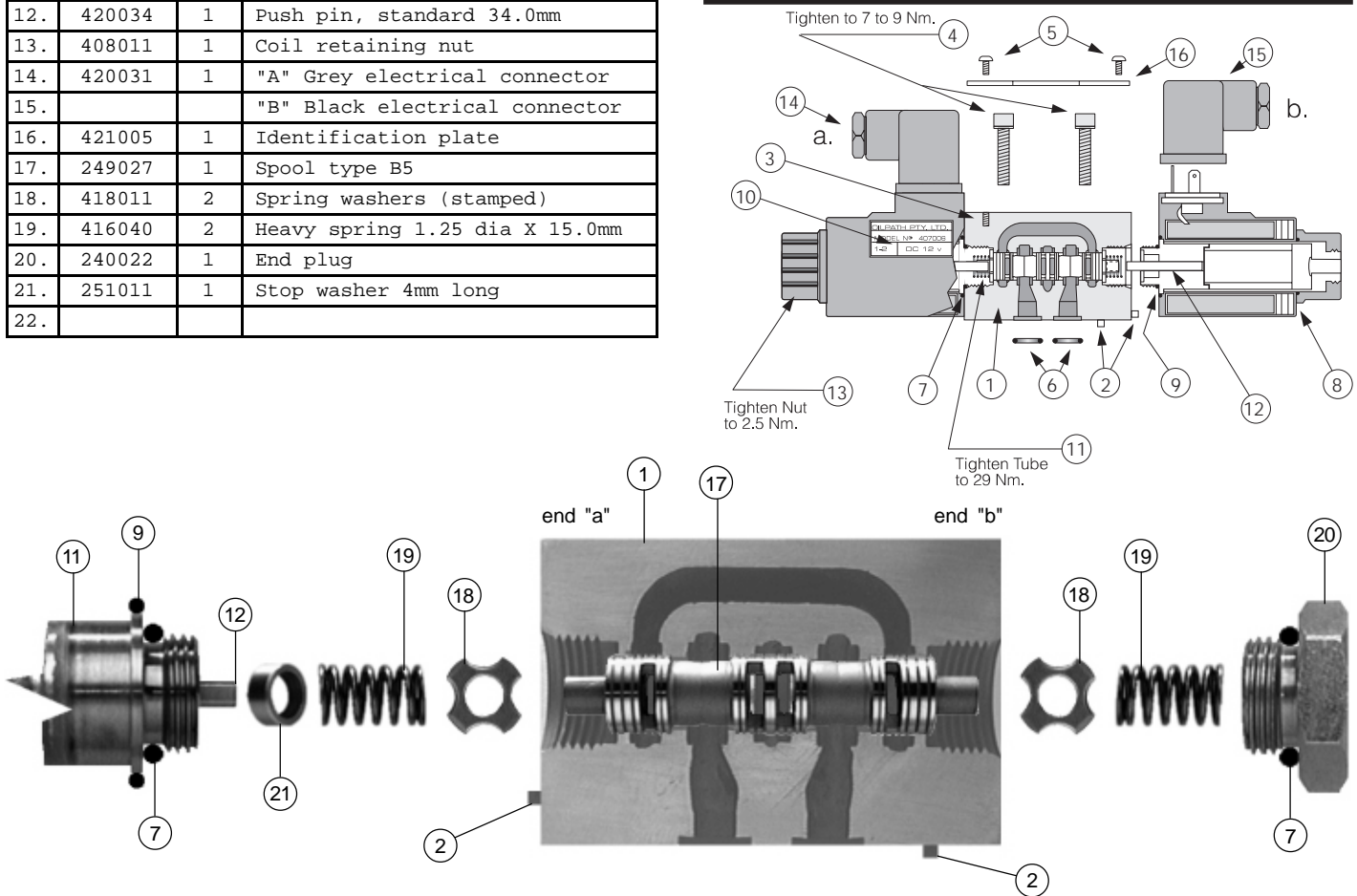
<b>MODEL NUMBER</b>	OP3 - S - * * * - * * * - * - * * * * * - * - * *
<b>SOLENOID ACTUATED</b>	
<b>SPOOL CODE</b>	See page 3 for details
<b>BUILD CODE</b>	See page 2 for details
<b>SEAL COMPOUND</b>	N Nitrile V Viton * Inquire
<b>COIL TYPE</b>	DC 12 Volts DC 24 Volts AC 24 Volts AC 110 Volts AC 240 Volts * * Enquire
<b>OTHER SPECIFICATIONS</b>	* * Refer to the factory
<b>PRODUCT ACCESSORIES</b>	* Refer to the factory

#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia  
 21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

#### WARNING !

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**OILPATH PTY LTD RESERVE THE RIGHT TO CHANGE SPECIFICATIONS, OR TO DISCONTINUE ANY PRODUCTS LISTED IN THIS DOCUMENT WITHOUT NOTICE.**

#### WARRANTY

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A21

It applies to valves with the following ordering codes:

1. OP3 - S - B5 - 2SA - N - 1 - AC24
2. OP3 - S - B5 - 2SA - N - 1 - AC110
3. OP3 - S - B5 - 2SA - N - 1 - AC240
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Screw the end plug into the valve body on end "b" and tighten to 29 N.m.
9. Screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coils fit flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **47**

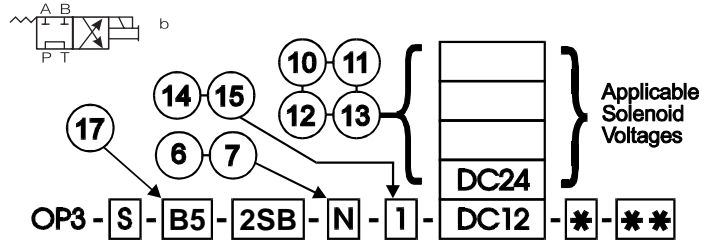
Revision Level **A**

Issue Date **20-1-94**

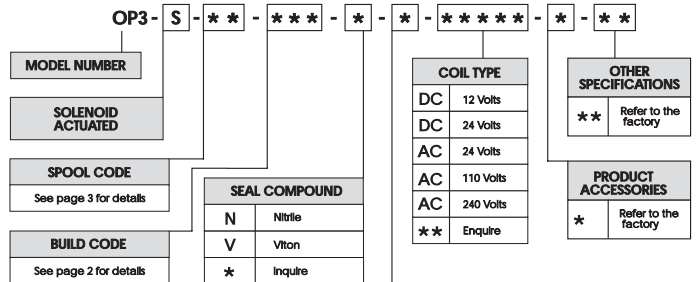
### ASSEMBLY SHEET No. **A22**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
			Coil A.C. 24 Volts
			Coil A.C. 110 Volts
			Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
			Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421006	1	Identification plate
17.	249027	1	Spool type B5
18.	418011	2	Spring washers (stamped)
19.	416040	2	Heavy spring 1.25 dia X 15.0mm
20.	418012	1	Spring spacer
21.	240022	1	End plug
22.	251011	1	Stop washer 4mm long



#### ORDERING CODE

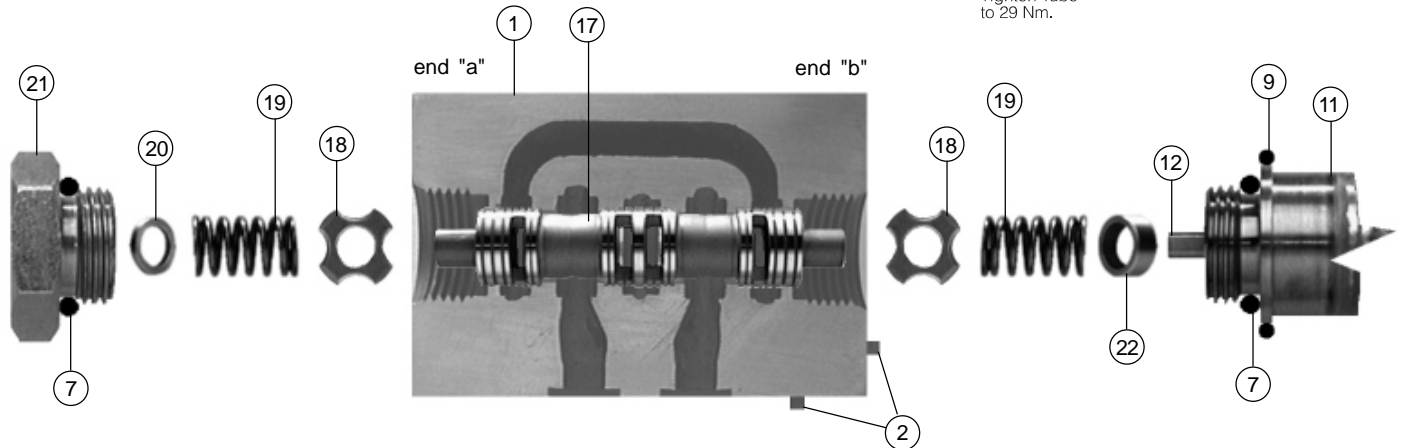
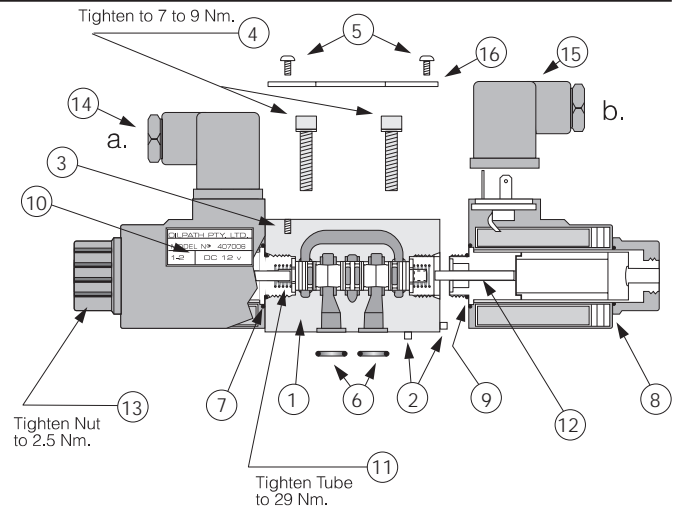


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A22

It applies to valves with the following ordering codes:

1. OP3 - S - B5 - 2SB - N - 1 - DC12
2. OP3 - S - B5 - 2SB - N - 1 - DC24
- 3.
- 4.
- 5.

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the spring spacer item No. 20 into the counterbore of the end plug item No. 21.
7. Place the stop washer item No. 22 into the counterbore of the tube item No. 11.
8. Put the springs item No. 19 into the counterbores of the tube and end plug.
9. Screw the end plug into the valve body on end "a" and tighten to 29 N.m.
10. Screw the tube into the valve body on end "b" and tighten to 29 N.m
11. Check that the pin item No. 2 is in the appropriate hole position on end "b".
12. Place the "O" ring item No. 9 onto the tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.



## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A23

It applies to valves with the following ordering codes:

1. OP3 - S - B5 - 2SB - N - 1 - AC24
2. OP3 - S - B5 - 2SB - N - 1 - AC110
3. OP3 - S - B5 - 2SB - N - 1 - AC240
- 4.
- 5.

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Screw the end plug into the valve body on end "a" and tighten to 29 N.m.
9. Screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure they locate onto the pin and sit tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coils fit flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **51**

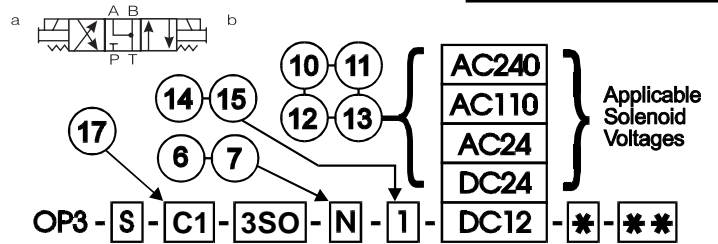
Revision Level **A**

Issue Date **20-1-94**

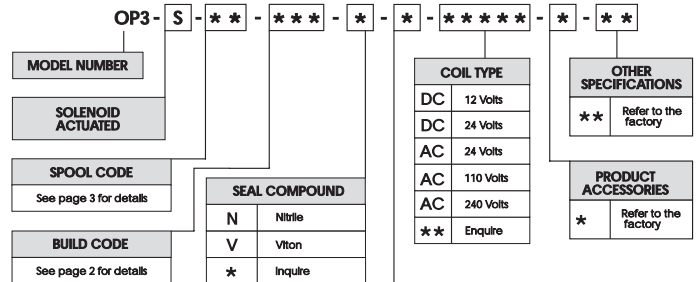
### ASSEMBLY SHEET No. **A24**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421007	1	Identification plate
17.	249032	1	Spool type C1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.			
21.			
22.			



#### ORDERING CODE

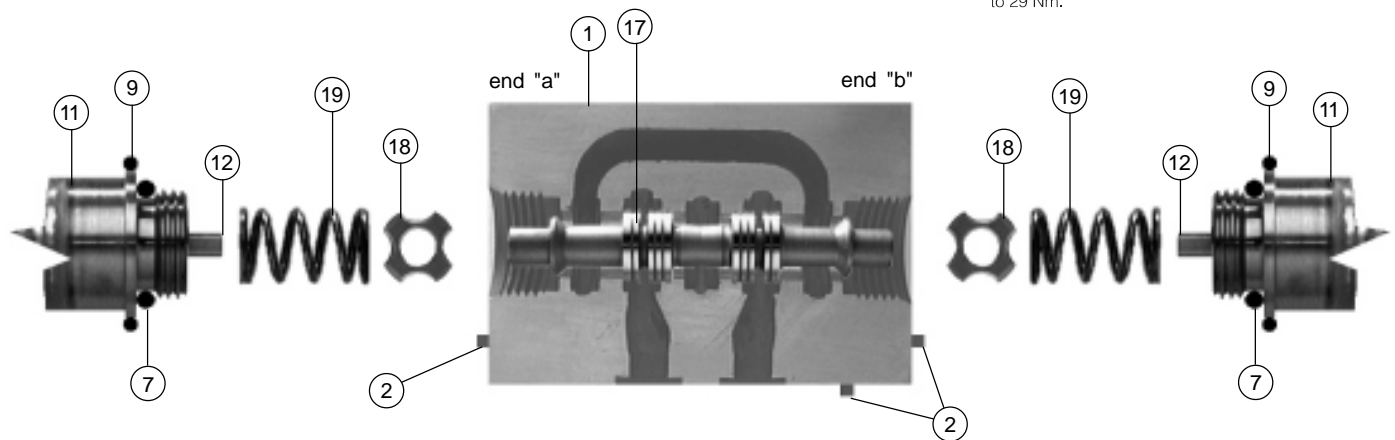
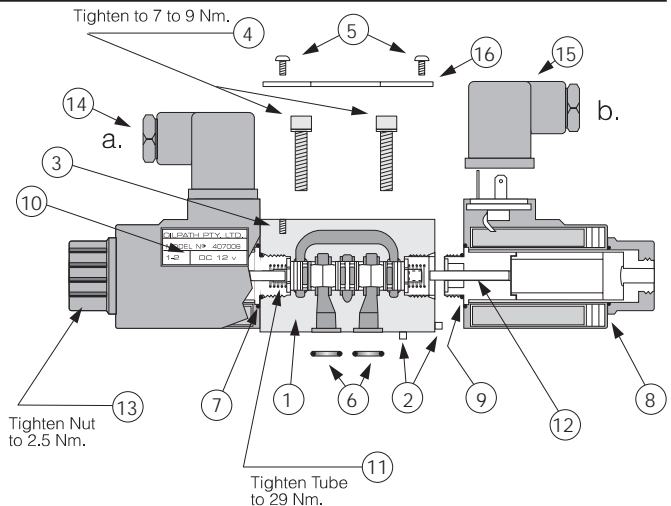


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A24

It applies to valves with the following ordering codes:

1. OP3 - S - C1 - 3SO - N - 1 - DC12
2. OP3 - S - C1 - 3SO - N - 1 - DC24
3. OP3 - S - C1 - 3SO - N - 1 - AC24
4. OP3 - S - C1 - 3SO - N - 1 - AC110
5. OP3 - S - C1 - 3SO - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the counterbores of item No.11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
15. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **53**

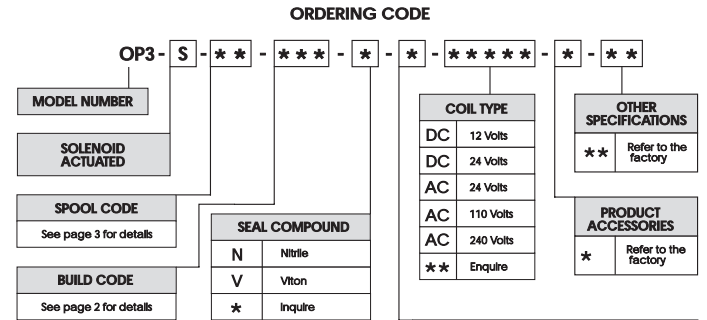
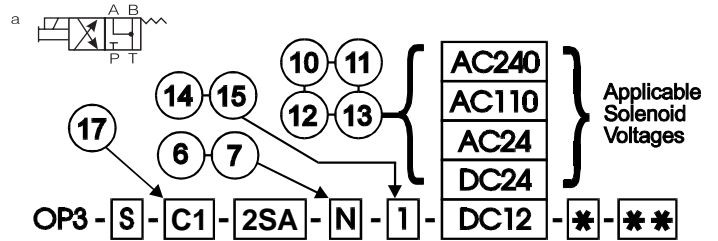
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A25**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421008	1	Identification plate
17.	249032	1	Spool type C1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4.0 mm long
22.			

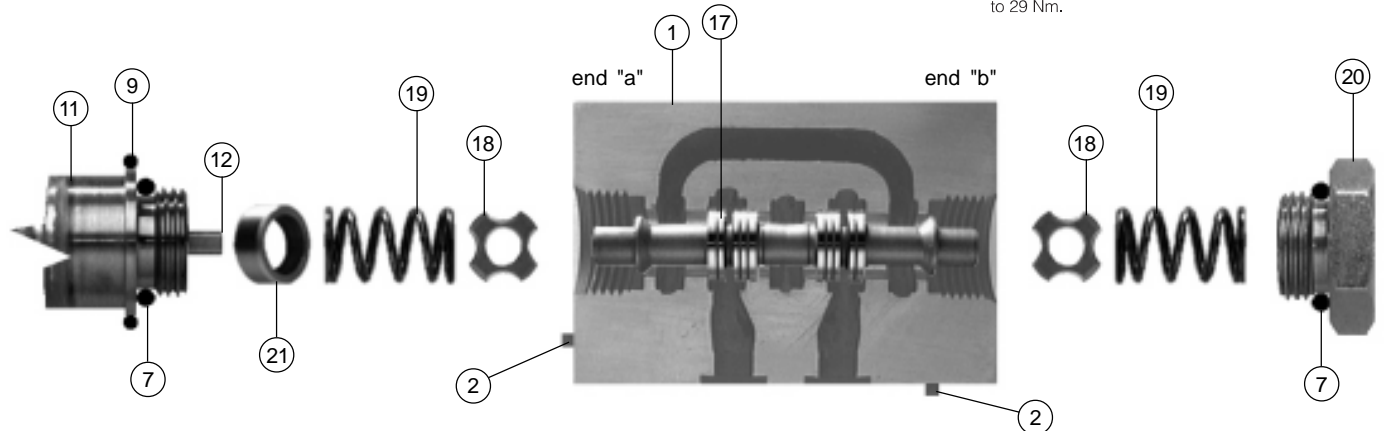
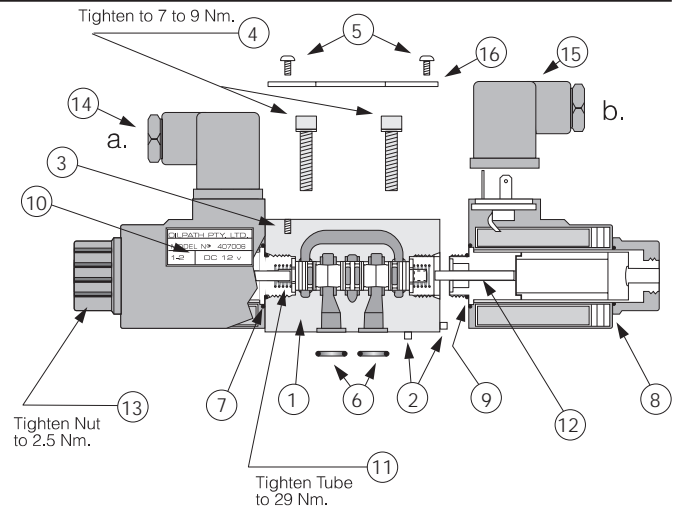


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A25

It applies to valves with the following ordering codes:

1. OP3 - S - C1 - 2SA - N - 1 - DC12
2. OP3 - S - C1 - 2SA - N - 1 - DC24
3. OP3 - S - C1 - 2SA - N - 1 - AC24
4. OP3 - S - C1 - 2SA - N - 1 - AC110
5. OP3 - S - C1 - 2SA - N - 1 - AC240

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "b" and tighten to 29 Nm.
9. Then screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **55**

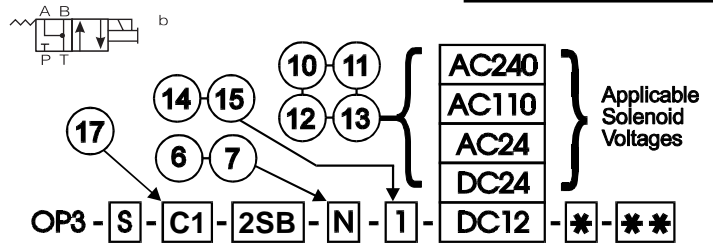
Revision Level **A**

Issue Date **20-1-94**

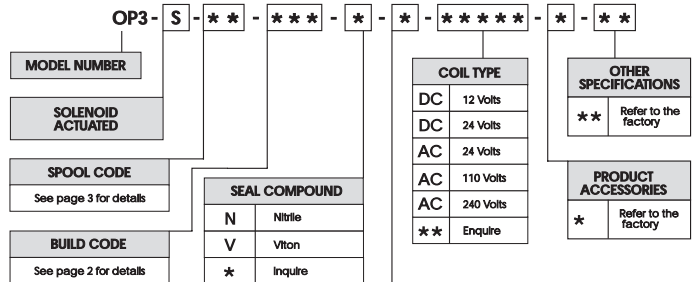
### ASSEMBLY SHEET No. **A26**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421009	1	Identification plate
17.	249032	1	Spool type C1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE

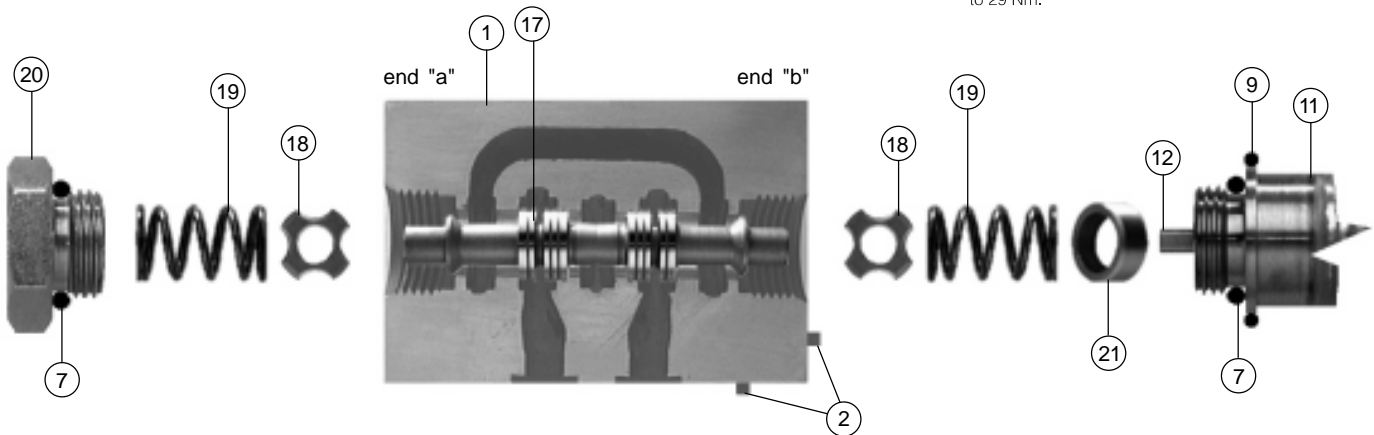
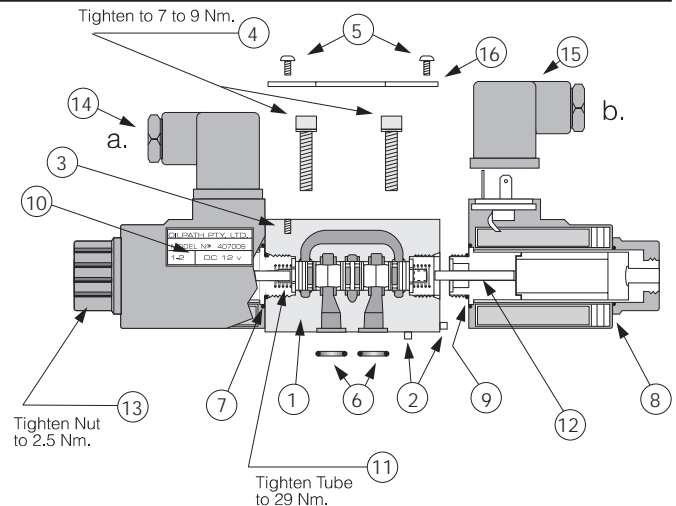


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
 A.C.N. 007 683 472  
 Incorporated in South Australia  
 21 Deloraine Road,  
 Edwardstown, South Australia 5039  
 Ph: (08) 2774933 Fax: (08) 2779126

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#### WARRANTY

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### ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A26

It applies to valves with the following ordering codes:

1. OP3 - S - C1 - 2SB - N - 1 - DC12
2. OP3 - S - C1 - 2SB - N - 1 - DC24
3. OP3 - S - C1 - 2SB - N - 1 - AC24
4. OP3 - S - C1 - 2SB - N - 1 - AC110
5. OP3 - S - C1 - 2SB - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "a" and tighten to 29 Nm.
9. Then screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **57**

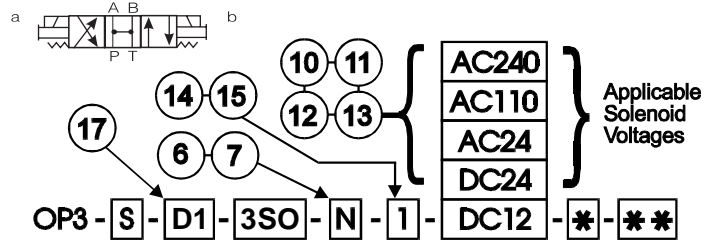
Revision Level **A**

Issue Date **20-1-94**

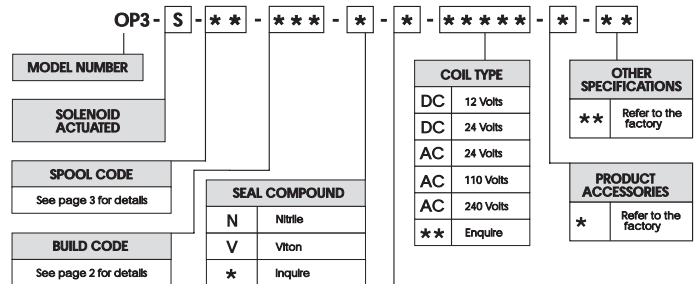
### ASSEMBLY SHEET No. **A27**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421010	1	Identification plate
17.	249035	1	Spool type D1
18.	251015	2	Cup washer (counterbore 1.1mm)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.			
21.			
22.			



#### ORDERING CODE

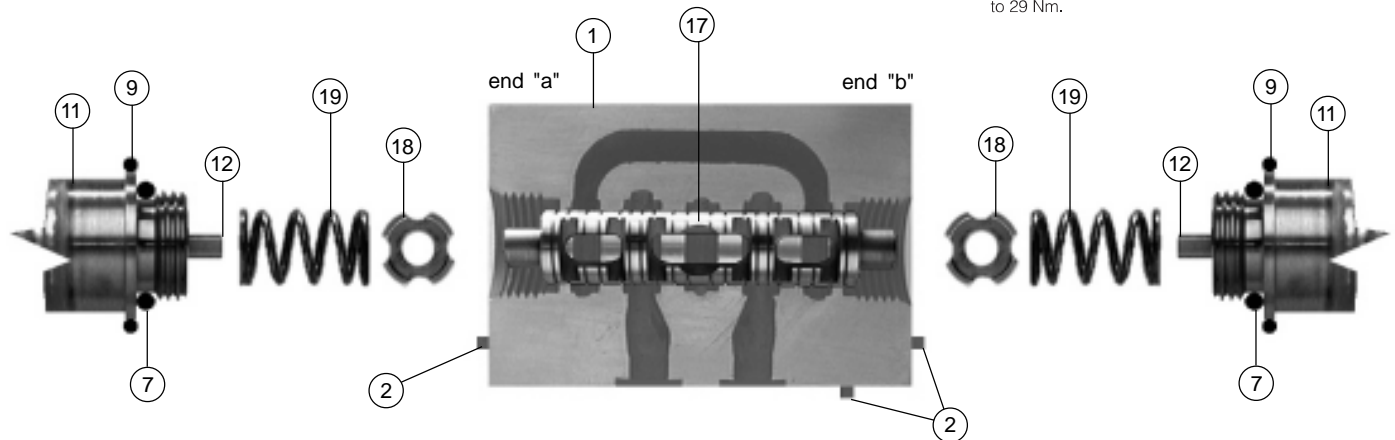
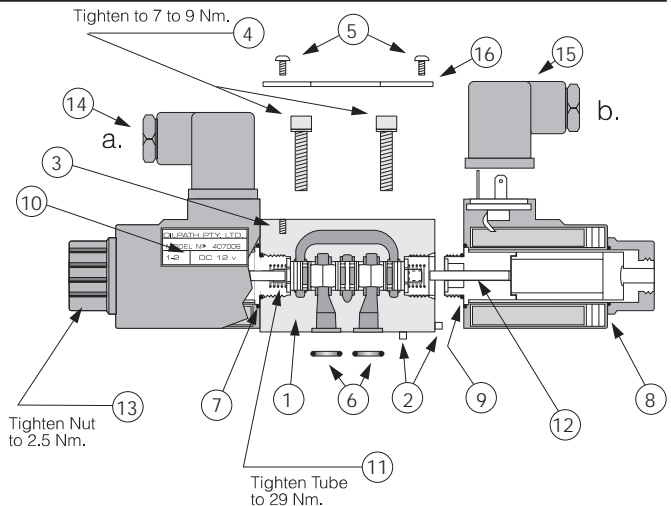


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A27

It applies to valves with the following ordering codes:

1. OP3 - S - D1 - 3SO - N - 1 - DC12
2. OP3 - S - D1 - 3SO - N - 1 - DC24
3. OP3 - S - D1 - 3SO - N - 1 - AC24
4. OP3 - S - D1 - 3SO - N - 1 - AC110
5. OP3 - S - D1 - 3SO - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the cup washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the tube counterbores item No.11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
15. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **59**

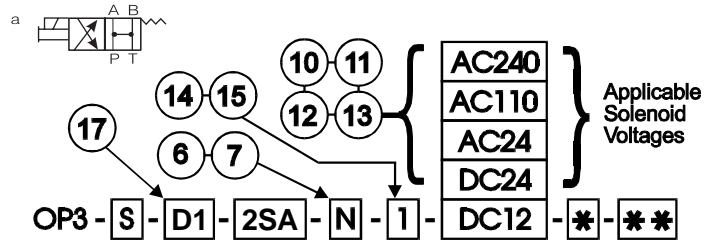
Revision Level **A**

Issue Date **20-1-94**

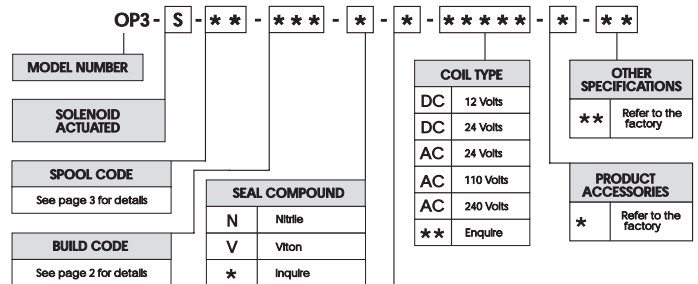
### ASSEMBLY SHEET No. **A28**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421011	1	Identification plate
17.	249035	1	Spool type D1
18.	251015	2	Cup washer (counterbore 1.1mm)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4.0 mm long
22.			



#### ORDERING CODE

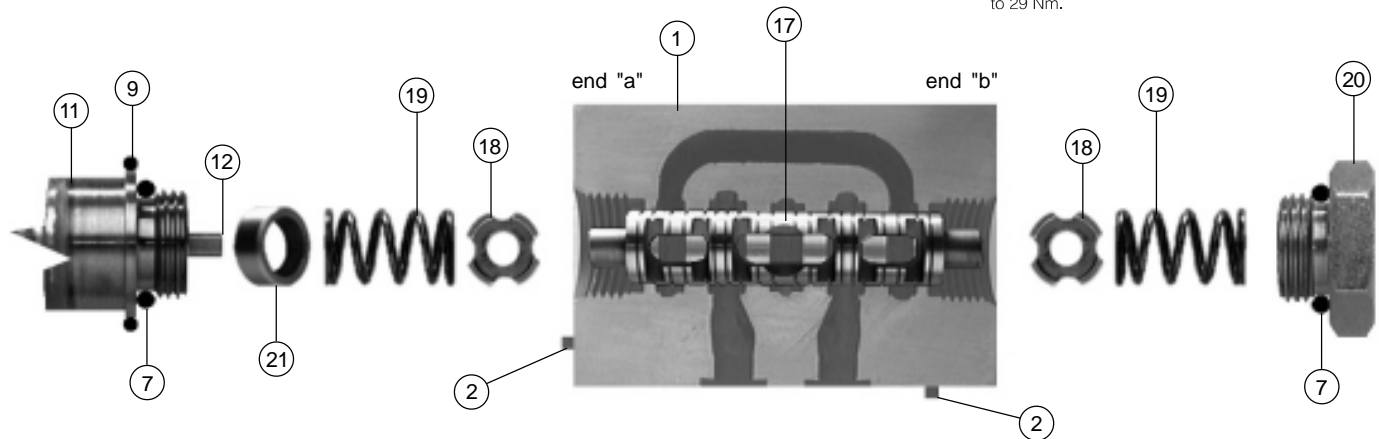
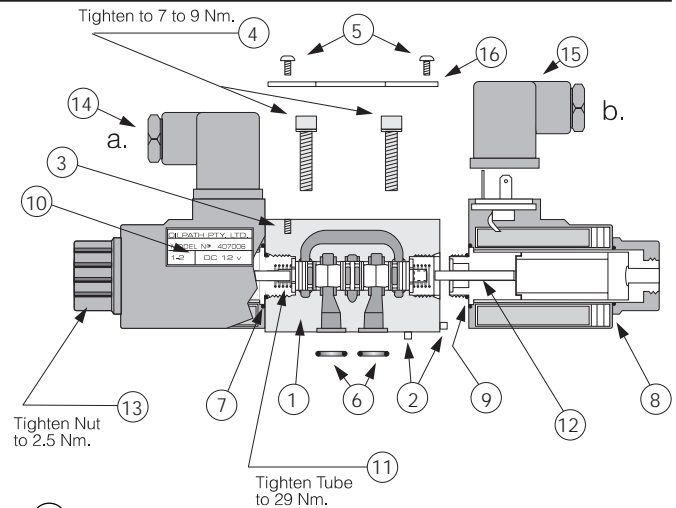


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A28

It applies to valves with the following ordering codes:

1. OP3 - S - D1 - 2SA - N - 1 - DC12
2. OP3 - S - D1 - 2SA - N - 1 - DC24
3. OP3 - S - D1 - 2SA - N - 1 - AC24
4. OP3 - S - D1 - 2SA - N - 1 - AC110
5. OP3 - S - D1 - 2SA - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the cup washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "b" and tighten to 29 N.m.
9. Then screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **61**

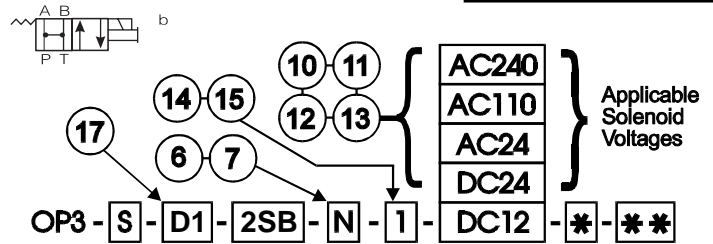
Revision Level **A**

Issue Date **20-1-94**

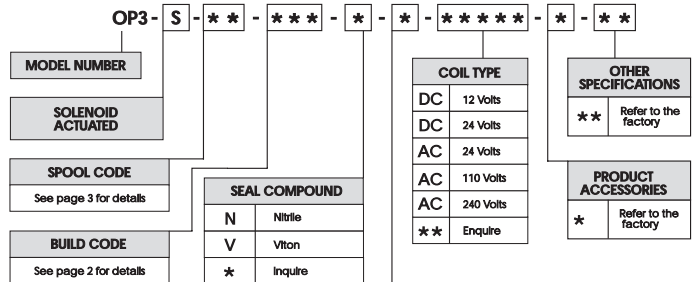
### ASSEMBLY SHEET No. **A29**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421012	1	Identification plate
17.	249035	1	Spool type D1
18.	251015	2	Cup washer (counterbore 1.1mm)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE



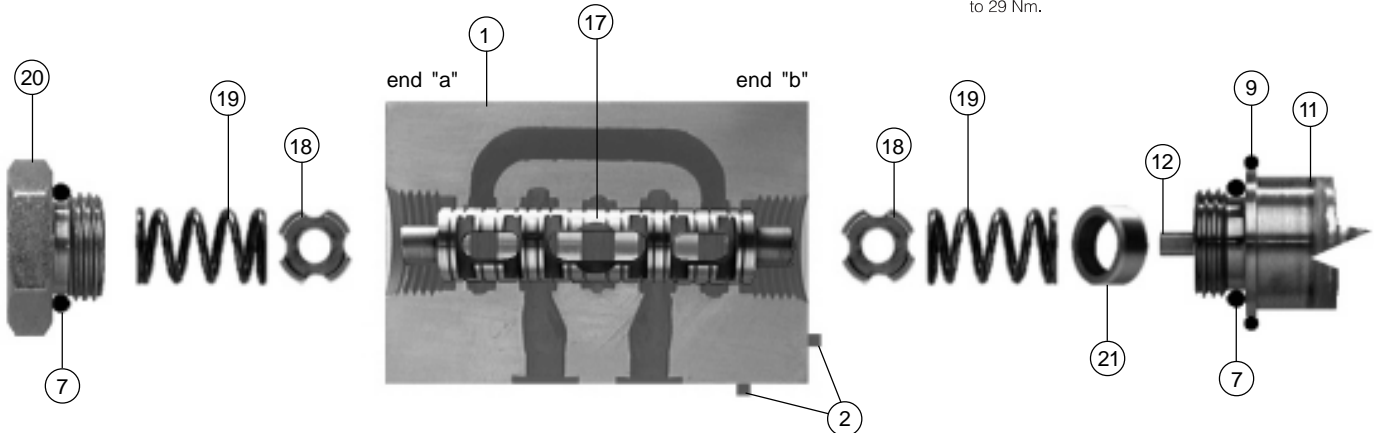
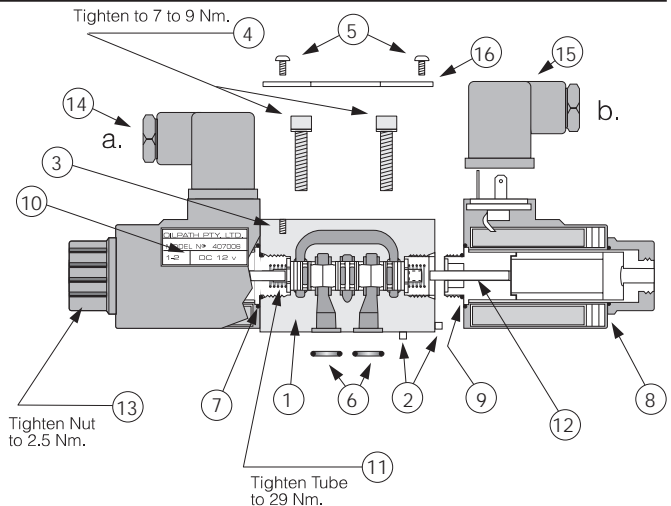
#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A29

It applies to valves with the following ordering codes:

1. OP3 - S - D1 - 2SB - N - 1 - DC12
2. OP3 - S - D1 - 2SB - N - 1 - DC24
3. OP3 - S - D1 - 2SB - N - 1 - AC24
4. OP3 - S - D1 - 2SB - N - 1 - AC110
5. OP3 - S - D1 - 2SB - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the cup washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "a" and tighten to 29 N.m.
9. Then screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **63**

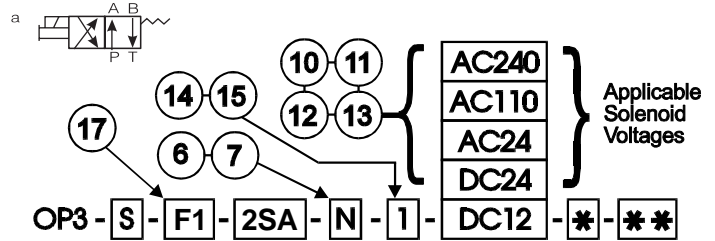
Revision Level **A**

Issue Date **20-1-94**

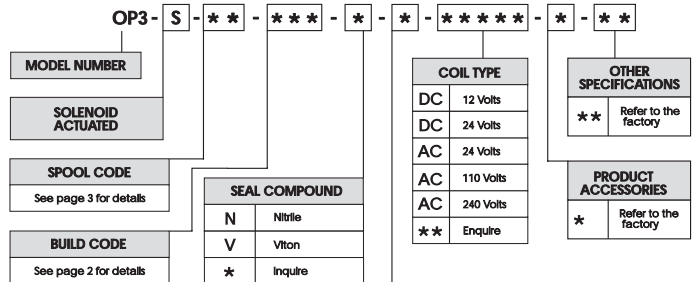
### ASSEMBLY SHEET No. **A30**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421013	1	Identification plate
17.	249037	1	Spool type F1
18.	251010	1	Offset washer 1.8mm
19.	416039	1	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	246017	1	Offset sleeve (counterbore 1.8mm)
22.	416042	1	Memory spring 1.25mm X 6.5mm



#### ORDERING CODE



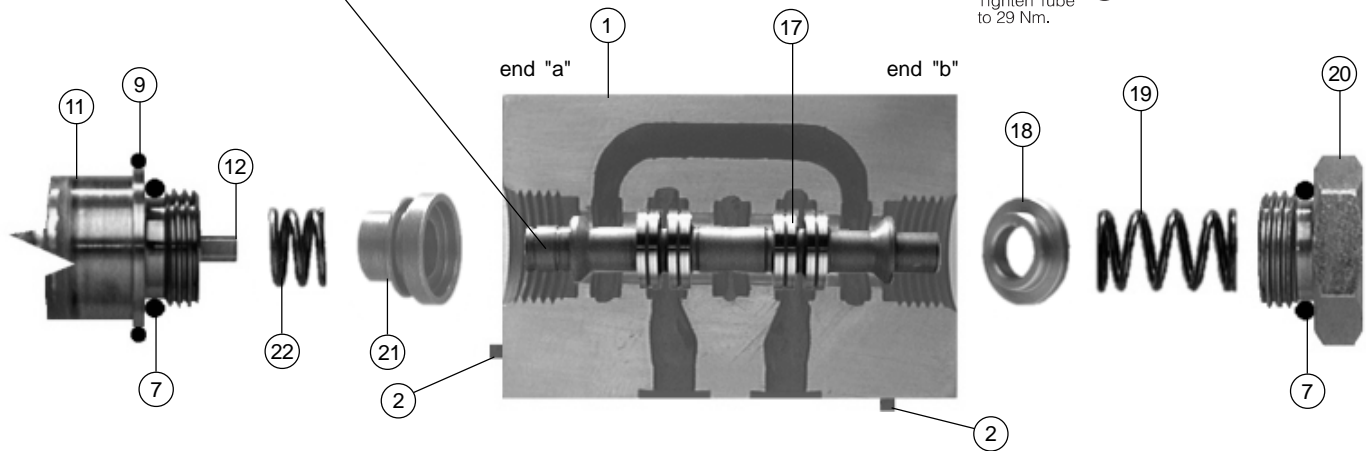
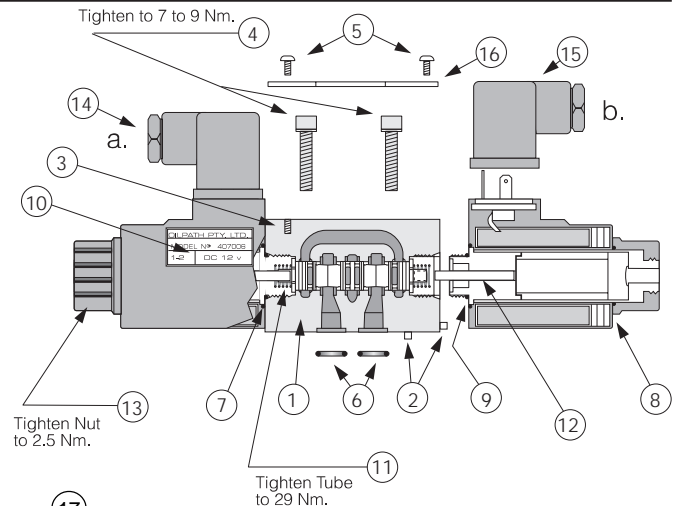
#### EXAMPLE

OP3-S-A1-3SO-N-1-AC240--

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Install the spool's 7.0 mm dia end (this end has the two detent grooves) so that it is positioned at the "a" end of the casting.



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
**OILPATH PTY. LTD.**  
A.C.N. 007 683 472  
Incorporated in South Australia

21 Deloraine Road,  
Edwardstown, South Australia 5039  
Ph: (08) 2774933 Fax: (08) 2779126

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#### WARRANTY

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A30

It applies to valves with the following ordering codes:

1. OP3 - S - F1 - 2SA - N - 1 - DC12
2. OP3 - S - F1 - 2SA - N - 1 - DC24
3. OP3 - S - F1 - 2SA - N - 1 - AC24
4. OP3 - S - F1 - 2SA - N - 1 - AC110
5. OP3 - S - F1 - 2SA - N - 1 - AC240

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement. Note: (see the component build code configuration for handing, assembly sheet A30).
4. Place the offset washer item No. 18 onto the spool on end "b".
5. Place the spring item No. 19 into the counter bore of the end plug item No. 20.
6. Then screw the end plug into the valve body on end "b and tighten to 29 N.m.
7. Check that the push pin item No. 12 is in place.
8. Place the spring item No. 22 into the counterbore of the tube item No. 11.
9. Place the offset sleeve item No. 21 up against the spring in the counterbore.
10. Then screw the tube into the valve body on end "a" and tighten to 29 N.m.
11. Check that the pin item No. 2 is in the appropriate hole position on end "a".
12. Place the "O" ring item No. 9 onto the solenoid tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **65**

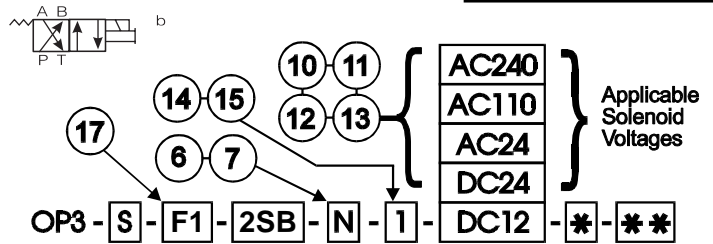
Revision Level **A**

Issue Date **20-1-94**

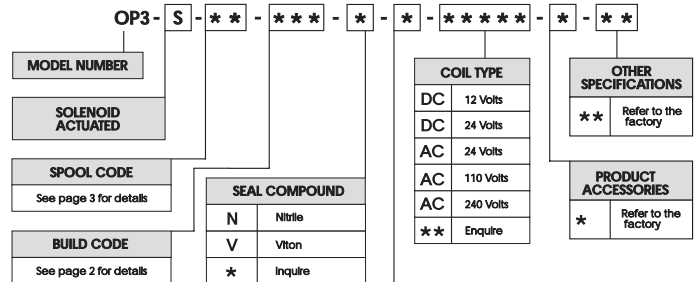
### ASSEMBLY SHEET No. **A31**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421014	1	Identification plate
17.	249037	1	Spool type F1
18.	251010	1	Offset washer 1.8mm
19.	416039	1	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug plug</td
21.	246017	1	Offset sleeve (counterbore 1.8mm)
22.	416042	1	Memory spring 1.25mm X 6.5mm



#### ORDERING CODE



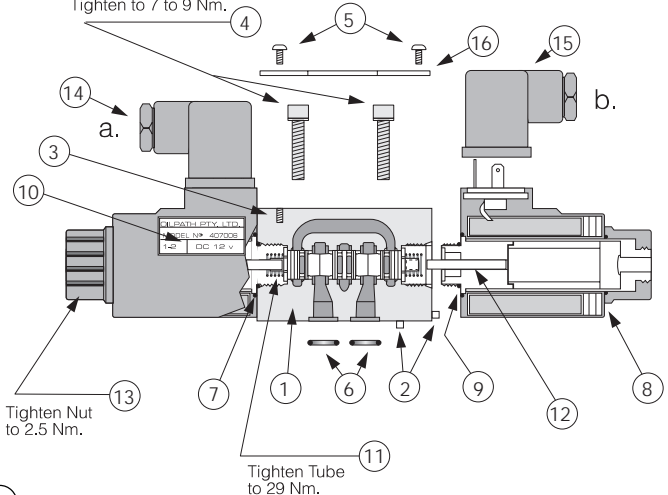
#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

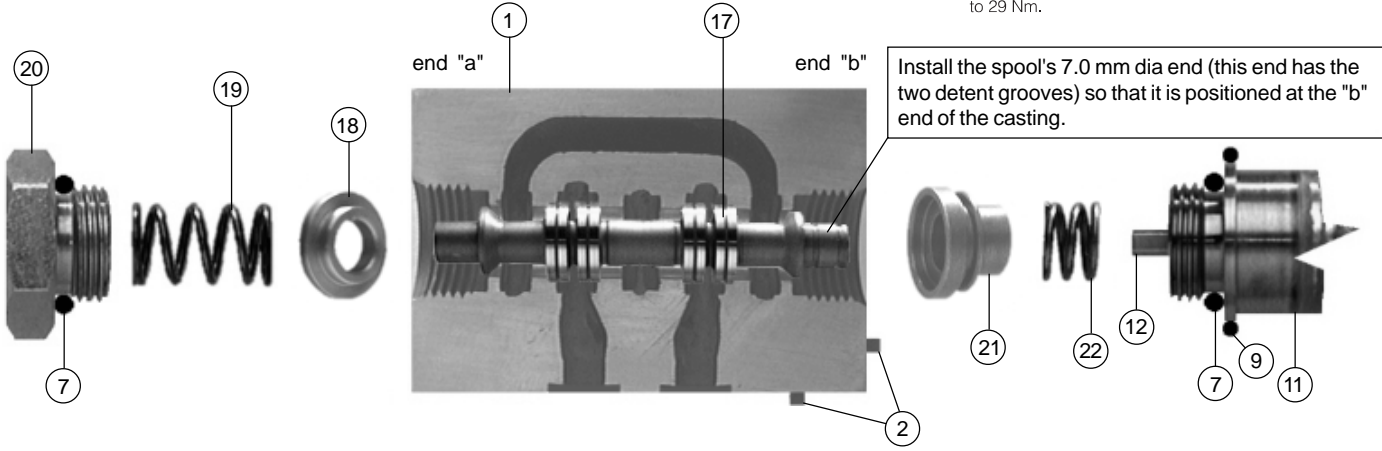
HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM L 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Tighten to 7 to 9 Nm.



Tighten Nut to 2.5 Nm.

Tighten Tube to 29 Nm.



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A31

It applies to valves with the following ordering codes:

1. OP3 - S - F1 - 2SB - N - 1 - DC12
2. OP3 - S - F1 - 2SB - N - 1 - DC24
3. OP3 - S - F1 - 2SB - N - 1 - AC24
4. OP3 - S - F1 - 2SB - N - 1 - AC110
5. OP3 - S - F1 - 2SB - N - 1 - AC240

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement. Note: (see the component build configuration for handing, assembly sheet A31).
4. Place the offset washer item No. 18 onto the spool on end "a".
5. Place the spring item No. 19 into the counterbore of the end plug item No. 20.
6. Then screw the end plug into the valve body on end "a" and tighten to 29 N.m.
7. Check that the push pin item No. 12 is in place.
8. Place the spring item No. 22 into the counterbore of the tube item No. 11.
9. Place the offset sleeve item No. 21 up against the spring in the counterbore.
10. Then screw the tube into the valve body on end "b" and tighten to 29 N.m.
11. Check that the pin item No. 2 is in the appropriate hole position on end "b".
12. Place the "O" ring item No. 9 on to the solenoid tube against the valve body.
13. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
14. Put the "O" ring item No. 8 onto the tube and against the coil.
15. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coil fits flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **67**

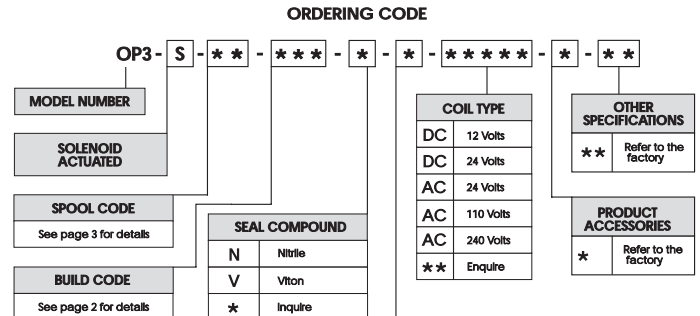
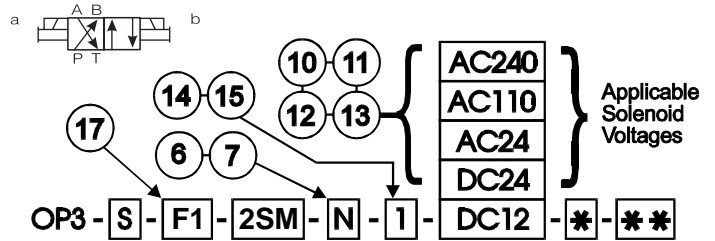
Revision Level **A**

Issue Date **20-1-94**

### ASSEMBLY SHEET No. **A32**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421015	1	Identification plate
17.	249032	1	Spool type F1
18.	246017	2	Offset sleeve (counterbore 1.8mm)
19.	416042	2	Memory spring 1.25 dia X 6.5mm
20.			
21.			
22.			

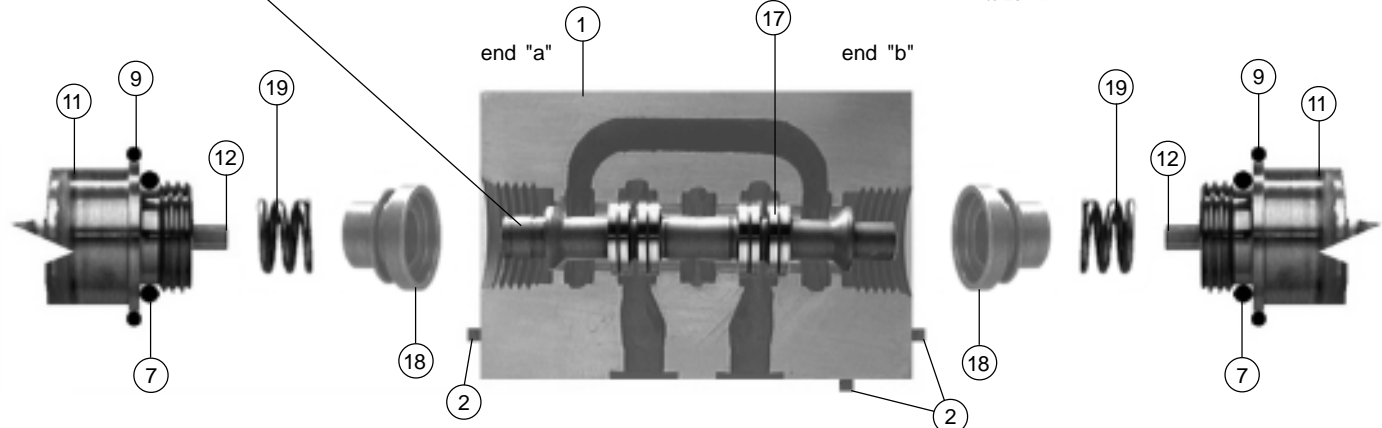
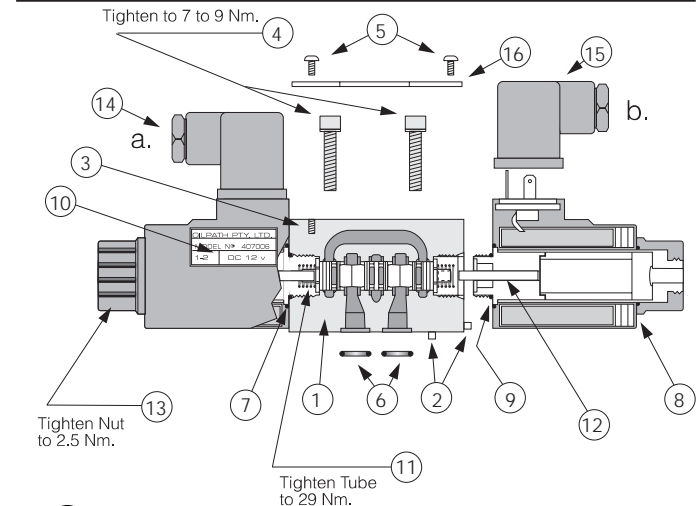


**EXAMPLE**  
**OP3 - S - A1 - 3SO - N - 1 - AC240 - -**

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

The F1 spool can be assembled into the valve in either direction. This only applies to this build code of 2SM.



### COMPONENT BUILD CONFIGURATION

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 A.C.N. 007 683 472  
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 Ph: (08) 2774933 Fax: (08) 2779126

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A32

It applies to valves with the following ordering codes:

1. OP3 - S - F1 - 2SM - N - 1 - DC12
2. OP3 - S - F1 - 2SM - N - 1 - DC24
3. OP3 - S - F1 - 2SM - N - 1 - AC24
4. OP3 - S - F1 - 2SM - N - 1 - AC110
5. OP3 - S - F1 - 2SM - N - 1 - AC240

**If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.**

**NOTE: *Disassembly is the reverse to assembly.***

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Check that the push pins item No. 12 are in place.
5. Place the springs item No. 19 into the counterbores of the tubes item No. 11.
6. Place the offset sleeves item No. 18 up against the springs in the counterbores.
7. Then screw the tubes into the valve body and tighten them to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" ring item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure that they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
15. If required reinstall the electrical connectors item No's. 14 & 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **69**

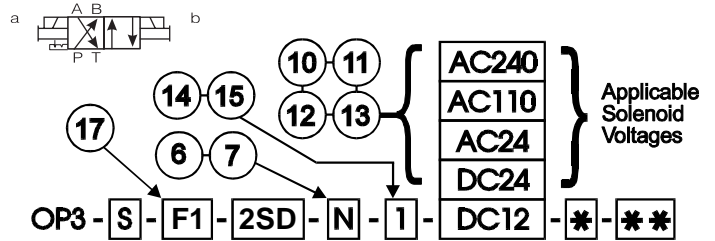
Revision Level **A**

Issue Date **20-1-94**

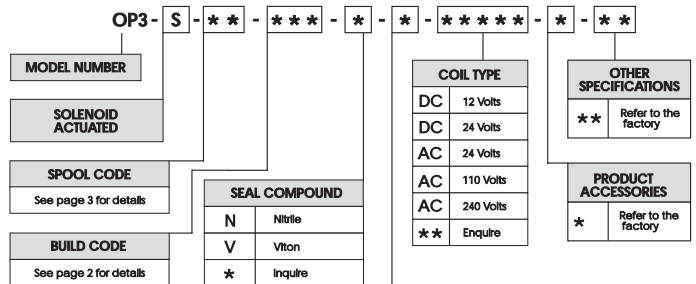
### ASSEMBLY SHEET No. **A33**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421016	1	Identification plate
17.	249037	1	Spool type F1
18.	246017	1	Offset sleeve (counterbore 1.8mm)
19.	416042	2	Memory springs 1.25 X 6.5mm
20.	246016	1	Detent sleeve (counter bore 1.8mm)
21.	417009	3	Detent chrome ball 3/32" dia
22.	416041	2	Detent circlip spring 0.5mm dia



#### ORDERING CODE

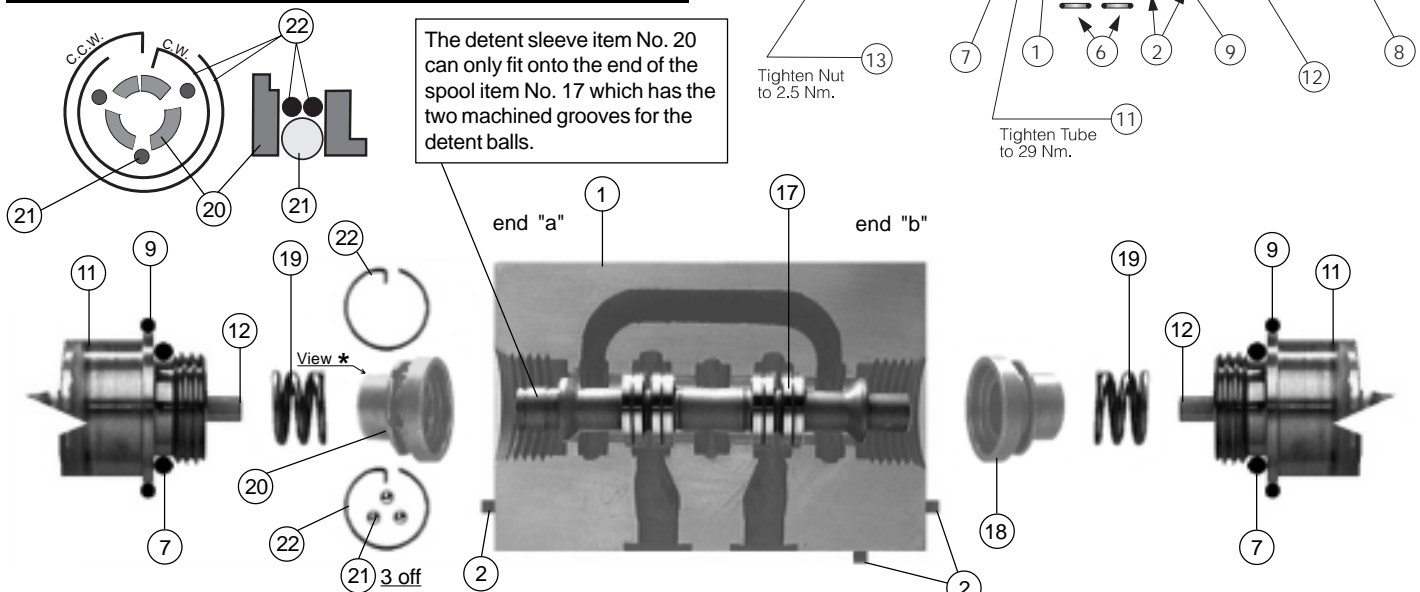


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A33

It applies to valves with the following ordering codes:

1. OP3 - S - F1 - 2SD - N - 1 - DC12
2. OP3 - S - F1 - 2SD - N - 1 - DC24
3. OP3 - S - F1 - 2SD - N - 1 - AC24
4. OP3 - S - F1 - 2SD - N - 1 - AC110
5. OP3 - S - F1 - 2SD - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
- 3.0 ***Firstly assemble the detent mechanism.***
- 3.1 View the detent sleeve item No. 20 from the \* end or smallest end.
- 3.2 Place one of the circlips item No. 22 onto the smallest end with the inward bent leg of the clip lined up with the smallest of the four radial holes drilled in the sleeve.
- 3.3 Ease the bent leg of the clip up and over and into the hole. Then carefully peel the remainder of the clip into the groove.
- 3.4 The second clip lays along side of the first clip, (as illustrated in the sketch) and is installed by the same method. "NOTE" the two clips must be installed in opposite directions, e.g. say first clip clockwise and the second clip counter clockwise.
- 3.5 With the aid of some hydraulic fluid of the type that the valve will use, put a coating on the three balls item No. 21 then place them through the sleeve's bore and into the three holes. "NOTE" by the use of a small magnetic screw driver and by having the three holes horizontal, assembly will be easier.
- 4.1 Push the detent end of the spool item No.17 into the counterbored end of the sleeve, locking onto the balls.
- 4.2 Carefully check the function of the detent in it's two positions.
5. Carefully place the combined spool and detent assembly into the valve body item No. 1 from end "a", checking for free and uninhibited movement.
6. Check that the push pins item No. 12 are in place.
7. Put the springs item No. 19 into the counterbores of the tubes item No.11.
8. Place the offset sleeve item No. 18 up against the spring in the counter bore of the tube for end "b".
9. Screw this tube etc. into end "b" of the valve body and tighten to 29 N.m.
10. Then screw the other tube and spring into the end "a" of the valve body and tighten to 29 N.m.
11. Check that the pins item No. 2 are in the appropriate hole positions.
12. Place the "O" rings item No. 9 onto the tubes against the valve body.
13. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
14. Put the "O" rings item No. 8 onto the tubes and against the coils.
15. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
16. Make sure that the coils fit flat and tight against the valve body end face.
17. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
18. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. 71

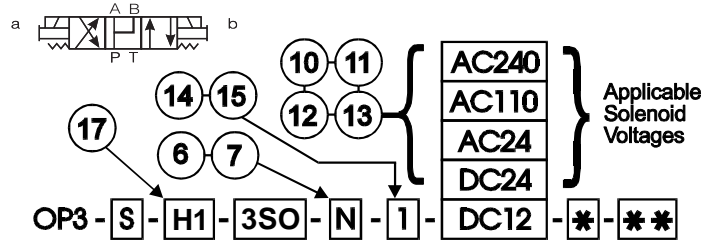
Revision Level A

Issue Date 20-1-94

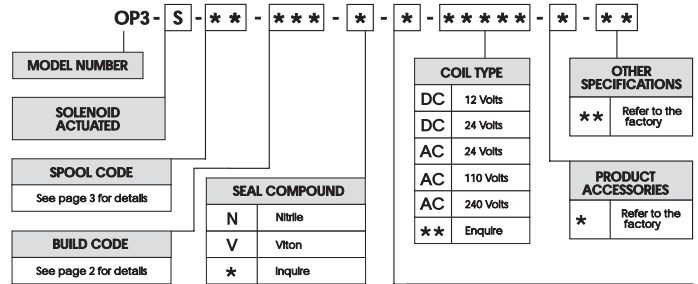
### ASSEMBLY SHEET No. A34

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	3	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	2	B.S. 019 "O" Ring Nitrile
9.	401025	2	S24 "O" Ring Nitrile
10.	423001	2	Coil D.C. 12 Volts
	423002	2	Coil D.C. 24 Volts
	423003	2	Coil A.C. 24 Volts
	423004	2	Coil A.C. 110 Volts
	423005	2	Coil A.C. 240 Volts
11.	422001	2	Tube for DC coils
	422002	2	Tube for AC coils
12.	420034	2	Push pin, standard 34.0mm
13.	408011	2	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421017	1	Identification plate
17.	249039	1	Spool type H1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.			
21.			
22.			



#### ORDERING CODE



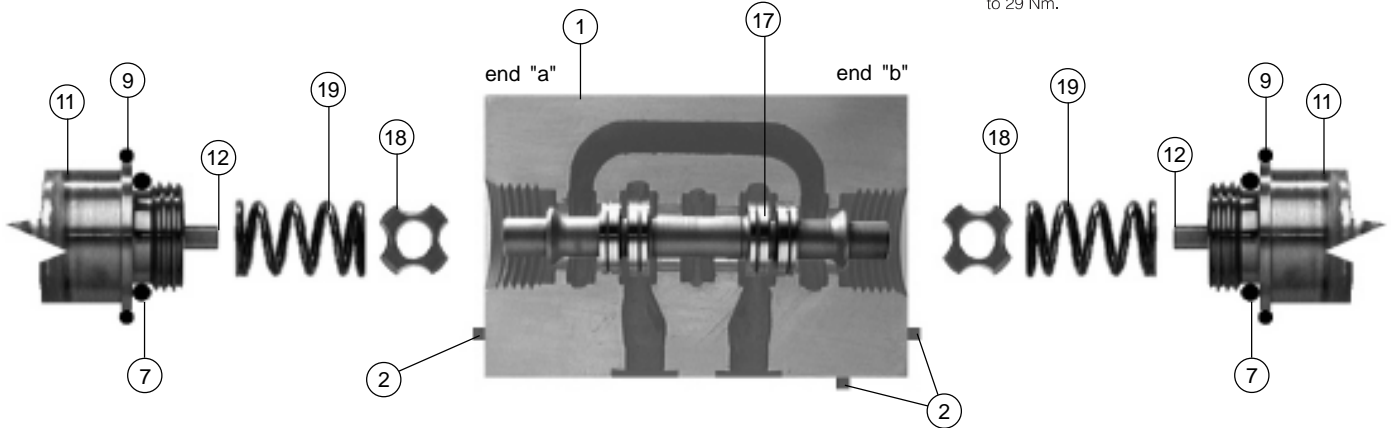
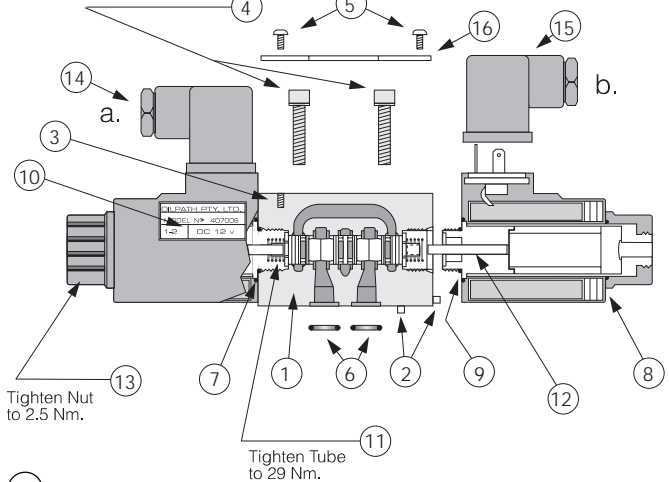
#### EXAMPLE

OP3-S-A1-3SO-N-1-AC240--

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

Manufactured by :

**OILPATH PTY. LTD.**  
A.C.N. 007 683 472  
Incorporated in South Australia

21 Deloraine Road,  
Edwardstown, South Australia 5039

Ph: (08) 2774933 Fax: (08) 2779126

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#### WARRANTY

Oilpath products are warranted to be free of defects in material or workmanship. This warranty voids all other warranties, whether expressed or implied, and shall be in effect for 6 months from date of purchase. The warranty is limited to replacement or repair, excluding seals or damage arising from misuse or incorrect installation. The company accepts no liability for faults caused by improper use or faulty maintenance of the product, or operation beyond recommended specifications, or contingent or consequential loss or damage under any situation whatsoever. All unauthorised modifications to the product automatically voids the conditions of this warranty.

## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A34

It applies to valves with the following ordering codes:

1. OP3 - S - H1 - 3SO - N - 1 - DC12
2. OP3 - S - H1 - 3SO - N - 1 - DC24
3. OP3 - S - H1 - 3SO - N - 1 - AC24
4. OP3 - S - H1 - 3SO - N - 1 - AC110
5. OP3 - S - H1 - 3SO - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pins item No. 12 are in place.
6. Put the springs item No. 19 into the tube counterbores of item No.11.
7. Screw the tubes item No. 11 into the valve body and tighten to 29 N.m.
8. Check that the pins item No. 2 are in the appropriate hole positions.
9. Place the "O" rings item No. 9 onto the tubes against the valve body.
10. Place the coils item No. 10 onto the tubes making sure they locate onto the pins and sit tight against the valve body.
11. Put the "O" rings item No. 8 onto the tubes and against the coils.
12. Fit the coil retaining nuts item No. 13 onto the tubes and tighten to 2.5 N.m. Do not over tighten.
13. Make sure that the coils fit flat and tight against the valve body end face.
14. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
15. If required reinstall the electrical connectors item No.'s 14 and 15 onto the coils firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **73**

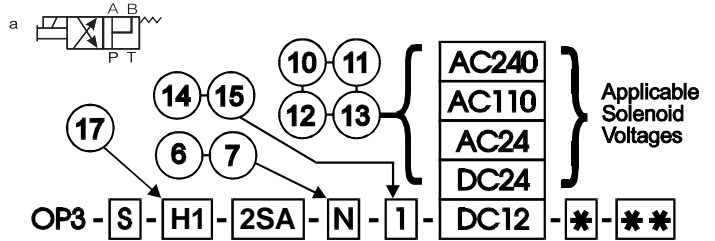
Revision Level **A**

Issue Date **20-1-94**

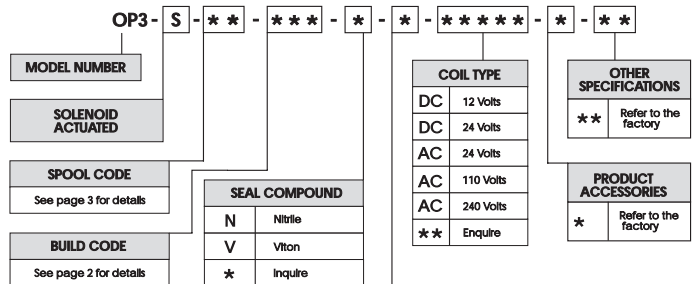
### ASSEMBLY SHEET No. **A35**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.	420031	1	"A" Grey electrical connector
15.			"B" Black electrical connector
16.	421018	1	Identification plate
17.	249039	1	Spool type H1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4.0 mm long
22.			



#### ORDERING CODE

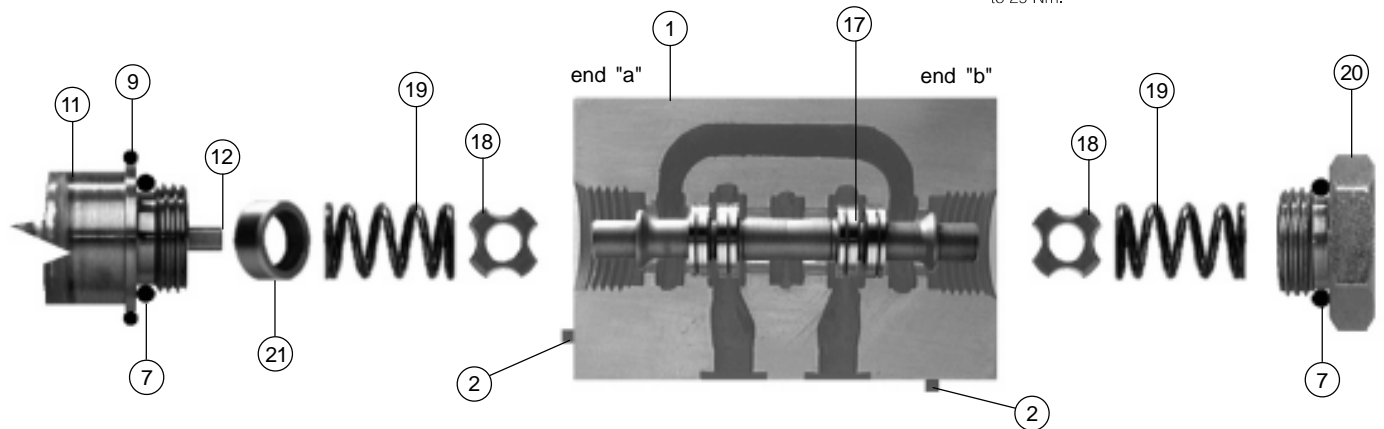
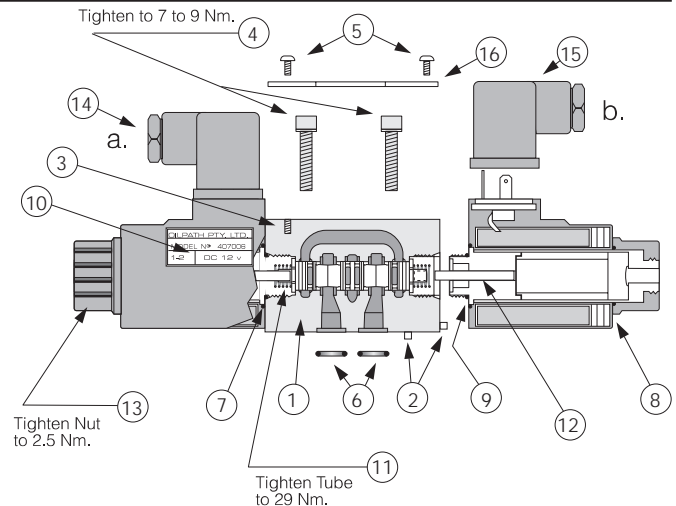


#### EXAMPLE

OP3 - S - A1 - 3SO - N - 1 - AC240 - -

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required



### COMPONENT BUILD CONFIGURATION

Manufactured by :  
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 A.C.N. 007 683 472  
 Incorporated in South Australia  
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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A35

It applies to valves with the following ordering codes:

1. OP3 - S - H1 - 2SA - N - 1 - DC12
2. OP3 - S - H1 - 2SA - N - 1 - DC24
3. OP3 - S - H1 - 2SA - N - 1 - AC24
4. OP3 - S - H1 - 2SA - N - 1 - AC110
5. OP3 - S - H1 - 2SA - N - 1 - AC240

If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "b" and tighten to 29 N.m.
9. Then screw the tube into the valve body on end "a" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "a".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 14 onto the coil firmly, but do not over tighten.

# OILPATH

## MODEL OP3

SOLENOID OPERATED DIRECTIONAL HYDRAULIC VALVE CETOP 3 (NG6)

Page No. **75**

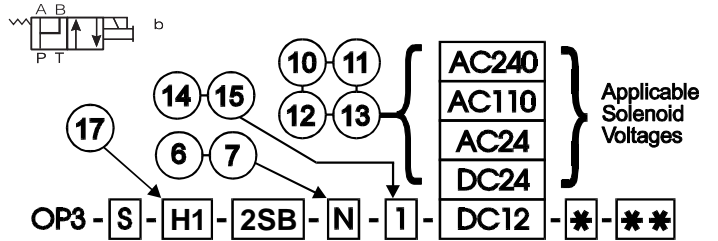
Revision Level **A**

Issue Date **20-1-94**

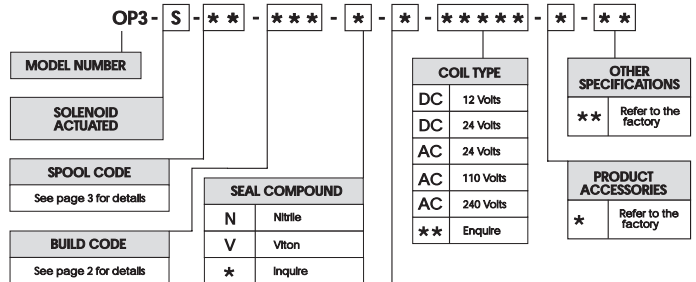
### ASSEMBLY SHEET No. **A36**

#### COMPONENT LIST AS STANDARD

No.	PART No.	No. Req.	DESCRIPTION
1.	203001	1	Cast Iron valve body
2.	420024	2	3.0 dia X 8mm long Sel-lock spring
3.	420008	2	M3 Thread inserts
4.	415037	4	S.H.C.S. M5 X 25mm long grade 12.
5.	415036	2	S/Steel Pan head screws M3
6.	401023	4	B.S. 012 "O" Rings Nitrile
7.	401020	2	P15 "O" Rings Nitrile
8.	401026	1	B.S. 019 "O" Ring Nitrile
9.	401025	1	S24 "O" Ring Nitrile
10.	423001	1	Coil D.C. 12 Volts
	423002	1	Coil D.C. 24 Volts
	423003	1	Coil A.C. 24 Volts
	423004	1	Coil A.C. 110 Volts
	423005	1	Coil A.C. 240 Volts
11.	422001	1	Tube for DC coils
	422002	1	Tube for AC coils
12.	420034	1	Push pin, standard 34.0mm
13.	408011	1	Coil retaining nut
14.			"A" Grey electrical connector
15.	420032	1	"B" Black electrical connector
16.	421019	1	Identification plate
17.	249039	1	Spool type H1
18.	418011	2	Spring washers (stamped)
19.	416039	2	Light spring 1.0 dia X 15.8mm
20.	240022	1	End plug
21.	251011	1	Stop washer 4mm long
22.			



#### ORDERING CODE



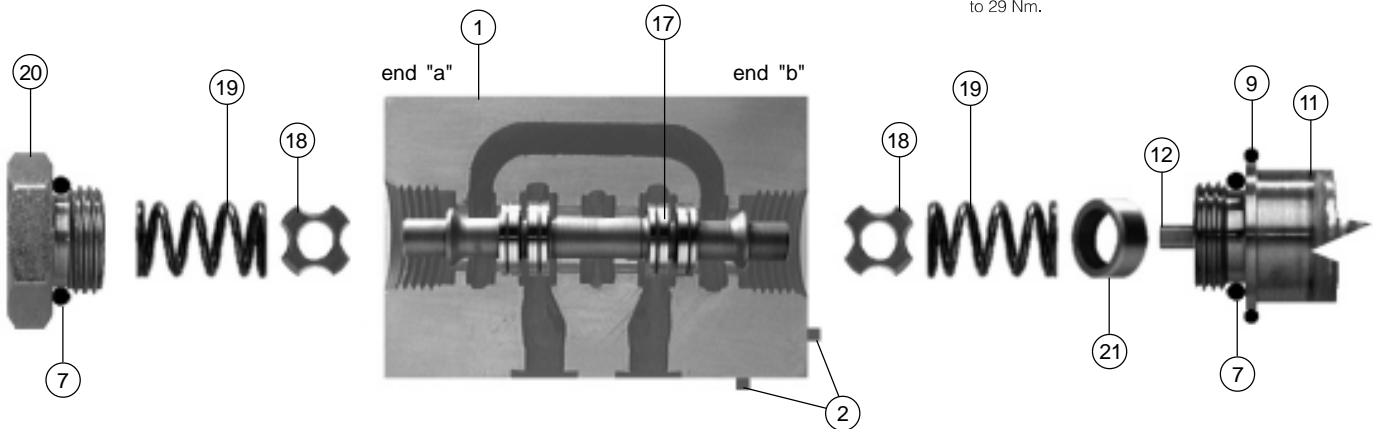
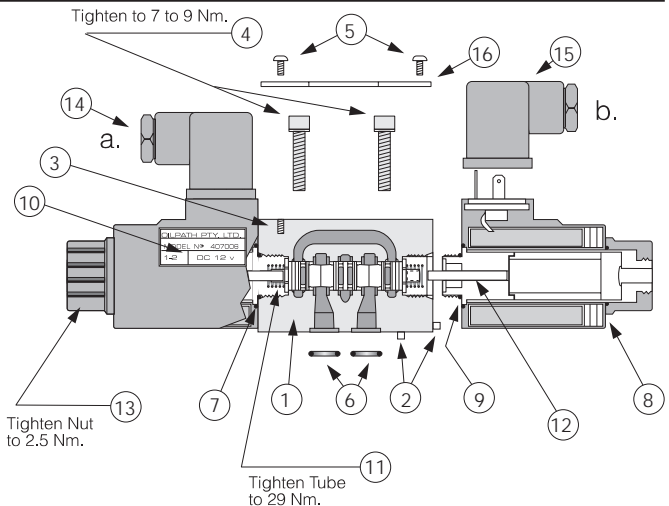
#### EXAMPLE

OP3-S-A1-3SO-N-1-AC240--

The above code describes a model OP3 valve that conforms to Cetop 3 standard. The spool is a three position all ports blocked in neutral and is operated by AC 240 volt coils with GDM 2011 connectors each end. The valve uses Nitrile seals and has no accessories or options.

HIRSCHMANN ELECTRICAL CONNECTOR	
1.	GDM 2011 as standard
2.	GDM1 2011 with light Indicator
3.	GDM 2011 with inbuilt surge absorber
*	Others, please specify if required

Tighten to 7 to 9 Nm.



### COMPONENT BUILD CONFIGURATION

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## ASSEMBLY PROCEDURE

This assembly procedure is in reference to Assembly Sheet No. A36

It applies to valves with the following ordering codes:

1. OP3 - S - H1 - 2SB - N - 1 - DC12
2. OP3 - S - H1 - 2SB - N - 1 - DC24
3. OP3 - S - H1 - 2SB - N - 1 - AC24
4. OP3 - S - H1 - 2SB - N - 1 - AC110
5. OP3 - S - H1 - 2SB - N - 1 - AC240

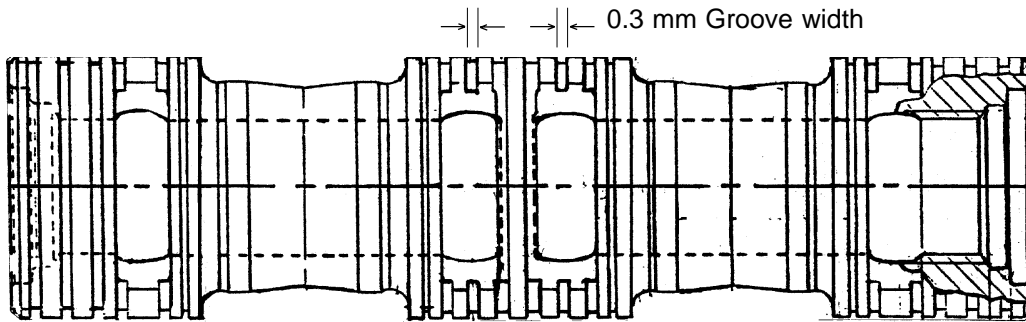
If the valve has been disassembled for repair or a spool, "O" Ring or coil voltage change, then the following procedure for reassembly is recommended.

**NOTE:** *Disassembly is the reverse to assembly.*

1. In case of a spool, "O" ring or coil voltage change, make sure the identification plate item No.16 is correct to the spool, "O" ring and coil voltage required.
2. If required replace the "O" rings item No. 6 and 7.
3. Place the spool item No.17 into the valve body item No. 1 carefully, checking for free and uninhibited movement.
4. Place the spring washers item No. 18 on the spool ends, they must be free in movement.
5. Check that the push pin item No. 12 is in place.
6. Place the stop washer item No. 21 into the tube counterbore item No. 11.
7. Put the springs item No. 19 into the tube and end plug item No. 20 counterbores.
8. Then screw the end plug into the valve body on end "a" and tighten to 29 N.m.
9. Then screw the tube into the valve body on end "b" and tighten to 29 N.m.
10. Check that the pin item No. 2 is in the appropriate hole position on end "b".
11. Place the "O" ring item No. 9 onto the tube against the valve body.
12. Place the coil item No. 10 onto the tube making sure that it locates onto the pin and sits tight against the valve body.
13. Put the "O" ring item No. 8 onto the tube and against the coil.
14. Fit the coil retaining nut item No. 13 onto the tube and tighten to 2.5 N.m. Do not over tighten.
15. Make sure that the coil fits flat and tight against the valve body end face.
16. If required reinstall the valve onto the manifold and tighten the socket head cap screws item No. 4 to 7 - 9 N.m.
17. If required reinstall the electrical connector item No. 15 onto the coil firmly, but do not over tighten.

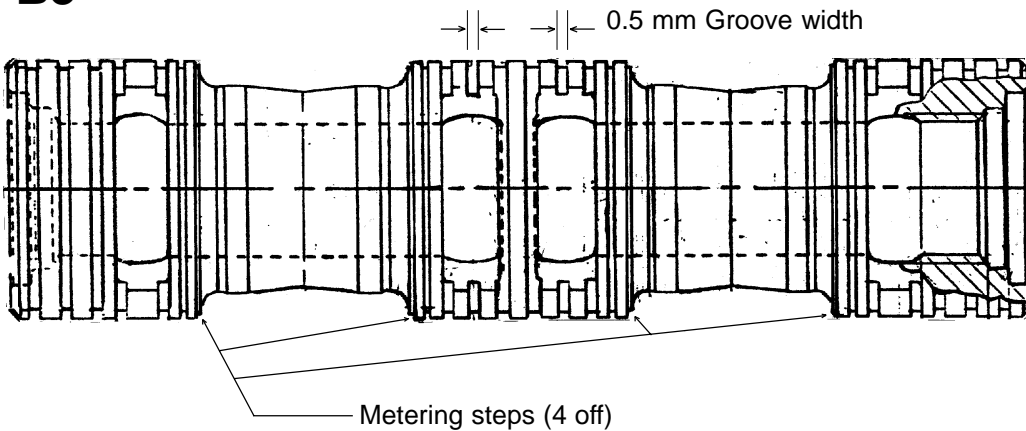
## IDENTIFICATION OF SPOOL TYPES B1, B3 & B5

### SPOOL B1



No metering steps

### SPOOL B3



### SPOOL B5

