

Prop. 3-Way Pressure-Reducing Cart., Size 5 / SAE 08

$Q_{\max} = 25 \text{ l/min (6.5 gpm)}$, $p_{\max} = 250 \text{ bar (3600 psi)}$

Direct acting, electrically operated

Series DRDTA-7M...



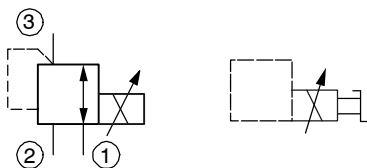
- Compact construction for cavity type AM – 3/4-16 UNF
- Fits common cavity according to ISO and NFPA (note the terminal assignment)
- Operated by a proportional solenoid
- 3 pressure ranges available
- Excellent stability over the whole pressure and flow range
- All exposed parts with zinc-nickel plating
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems and voltages are available
- Optional with integral manual pressure setting
- Can be fitted in a line-mounting body

1 Description

Series DRDTA-7M... proportional 3-way pressure-reducing cartridges are size 5 / SAE 08, high performance screw-in cartridges with an 3/4-16 UNF mounting thread. They reduce the outlet pressure in 3 as a function of the control current signal and independently of the inlet pressure in 2. In the initial position (solenoid de-energized) the inlet of the 3-way pressure-reducing cartridge is shut off and the outlet is connected to tank (port 3 → 1). In control mode, the connection 2 → 3 opens until the pressure in port 3 reaches the preset level. If the pressure rises above the preset level, the control spool opens the 3 → 1 connection until balance is attained. Three pressure ranges are available, with maxi-

mum operating pressure (inlet pressure) p_{\max} 250 bar. If a proportional solenoid is faulty, for example, the integral manual pressure setting supplied as option enables the required pressure to be set mechanically up to max. 60% of the nominal pressure. These 3-way pressure-reducing cartridges are predominantly used for reducing a system pressure in mobile and industrial applications. All external parts of the cartridge are zinc-nickel plated according to DIN EN ISO 19 598 and are thus suitable for use in the harshest operating environments. For self-assembly, please refer to the section related data sheets.

2 Symbol



DRDTA-7M...-O... DRDTA-7M...-S...

3 Technical data

General characteristics	Description, value, unit
Designation	proportional 3-way pressure-reducing cartridge
Design	direct acting, electrically operated
Mounting method	screw-in cartridges 3/4-16 UNF
Tightening torque	40 Nm ± 10 % (30 ft-lbs ± 10 %)

Reference: 400-P-591065-EN-00

General characteristics	Description, value, unit
Size	nominal size 5 / SAE 08, cavity type AM fits common cavity ISO17209: 3/4-03-0-13 fits common cavity NFPA/T3.5.50: 0.750-03-0-09 (note the terminal assignment)
Weight	0.4 kg (0.9 lbs)
Mounting attitude	unrestricted (preferably vertical, coil down)
Ambient temperature range	-25 °C ... +60 °C (-13 °F ... +140 °F)
MTTF _D values	150 years, see data sheet 400-P-010101-en

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	250 bar (3600 psi)
Maximum flow rate	25 l/min ¹⁾ (6.5 gpm)
Nominal pressure ranges	70 bar, 100 bar, 150 bar (1000 psi, 1400 psi, 2100 psi)
Flow direction	see symbols
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Hydraulic fluid temperature range	-25 °C ... +70 °C (-13 °F ... +158 °F)
Viscosity range	15...380 mm ² /s (cSt), recommended 20...130 mm ² /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 18/16/13



IMPORTANT!

¹⁾ The restrictions of the maximum flow rate depend on the inlet pressure. See performance graphs.

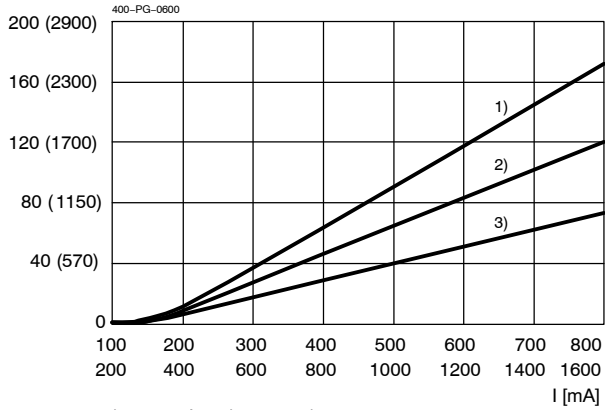
Electrical characteristics	Description, value, unit
Supply voltage	12 V DC, 24 V DC
Control current	12 V = 0...1600 mA, 24 V = 0...800 mA
Power consumption at max. control current	max. 17.5 W
Coil resistance R - cold value at 20 °C - max. warm value	12 V = 4.35 Ω / 24 V = 17.2 Ω 12 V = 6.8 Ω / 24 V = 26.9 Ω
Recommended PWM frequency (dither)	150 Hz
Hysteresis with PWM	3...6 % I _N
Reversal error with PWM	3...6 % I _N
Sensitivity with PWM	< 2 % I _N
Reproducibility with PWM	< 3 % p _N
Relative duty cycle	100 %
Protection class to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see "Ordering code" (with appropriate mating connector and proper fitting and sealing)
Electrical connection	DIN EN 175301-803, 3-pin 2 P+E (standard) for other connectors, see "Ordering code"

4 Performance graphs

measured with oil viscosity 33 mm²/s (cSt)

$p = f(I)$ Pressure adjustment characteristic

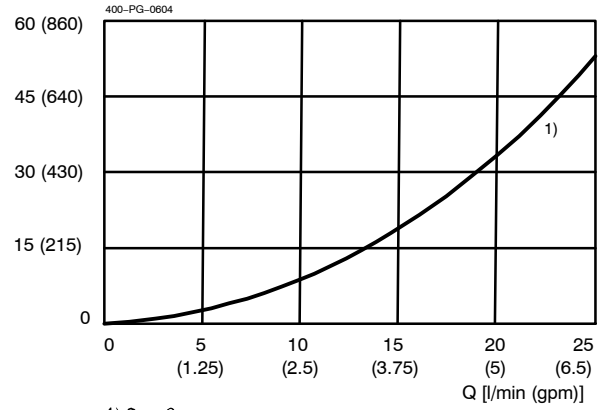
p_3 [bar (psi)]



- 1) p_N 150 bar (2100 psi)
- 2) p_N 100 bar (1400 psi)
- 3) p_N 70 bar (1000 psi)

$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic

Δp [bar (psi)]



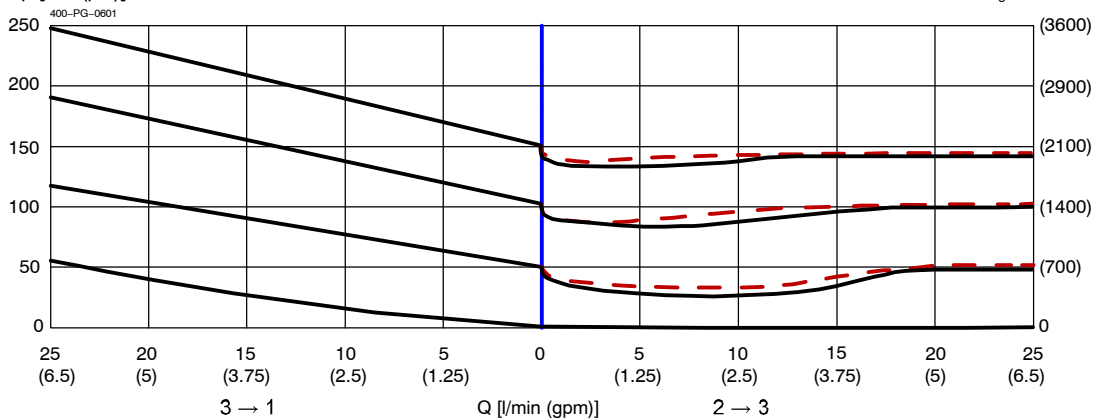
1) 2 → 3

$p = f(Q)$ Pressure - Flow rate characteristic

$p_N = 150$ bar (2100 psi)

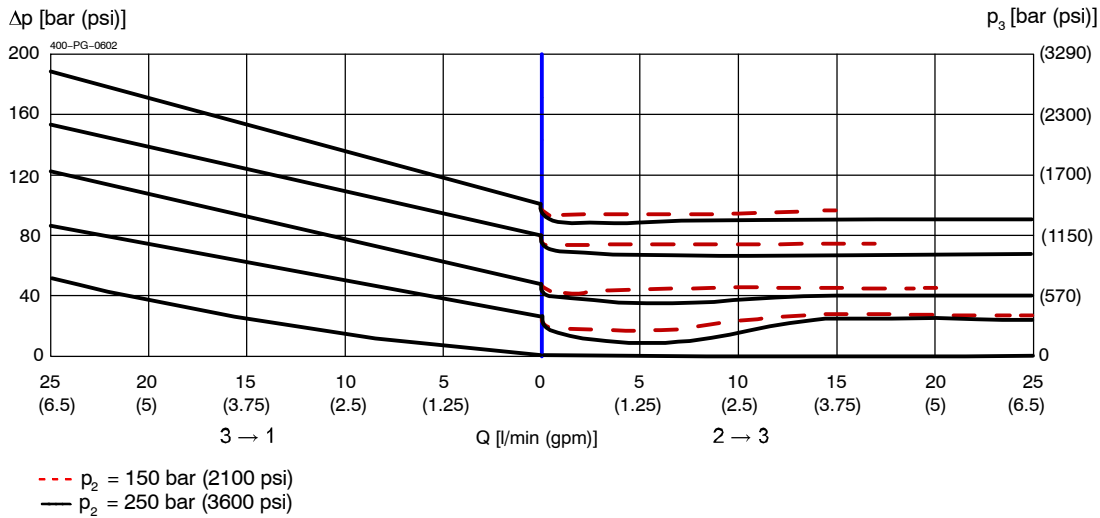
Δp [bar (psi)]

p_3 [bar (psi)]

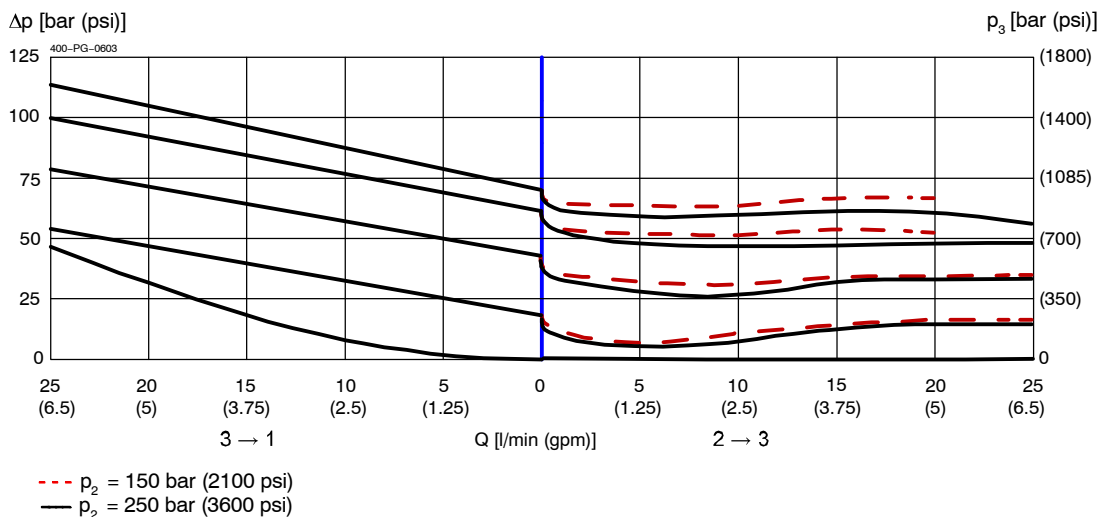


- $p_2 = 200$ bar (2900 psi)
- $p_2 = 250$ bar (3600 psi)

$p = f(Q)$ Pressure - Flow rate characteristic $p_N = 100 \text{ bar (1400 psi)}$



$p = f(Q)$ Pressure - Flow rate characteristic $p_N = 070 \text{ bar (1000 psi)}$



5 Installation information



IMPORTANT!

To achieve the maximum performance rating, fit the solenoid coil as shown (with the plug pins at the bottom) and install the valve in a steel body. When fitting the cartridges, note the mounting attitude (preferably vertical, with coil down → automatic air bleed) and use the specified tightening torque. No adjustments are necessary, since the cartridges are set in the factory.



ATTENTION!

Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.



ATTENTION!

To prevent any pressure surges, port 1 must be routed to tank with the least possible back-pressure. Any tank pressure acting at port 1 is additive to the pressure setting at the main port 3.

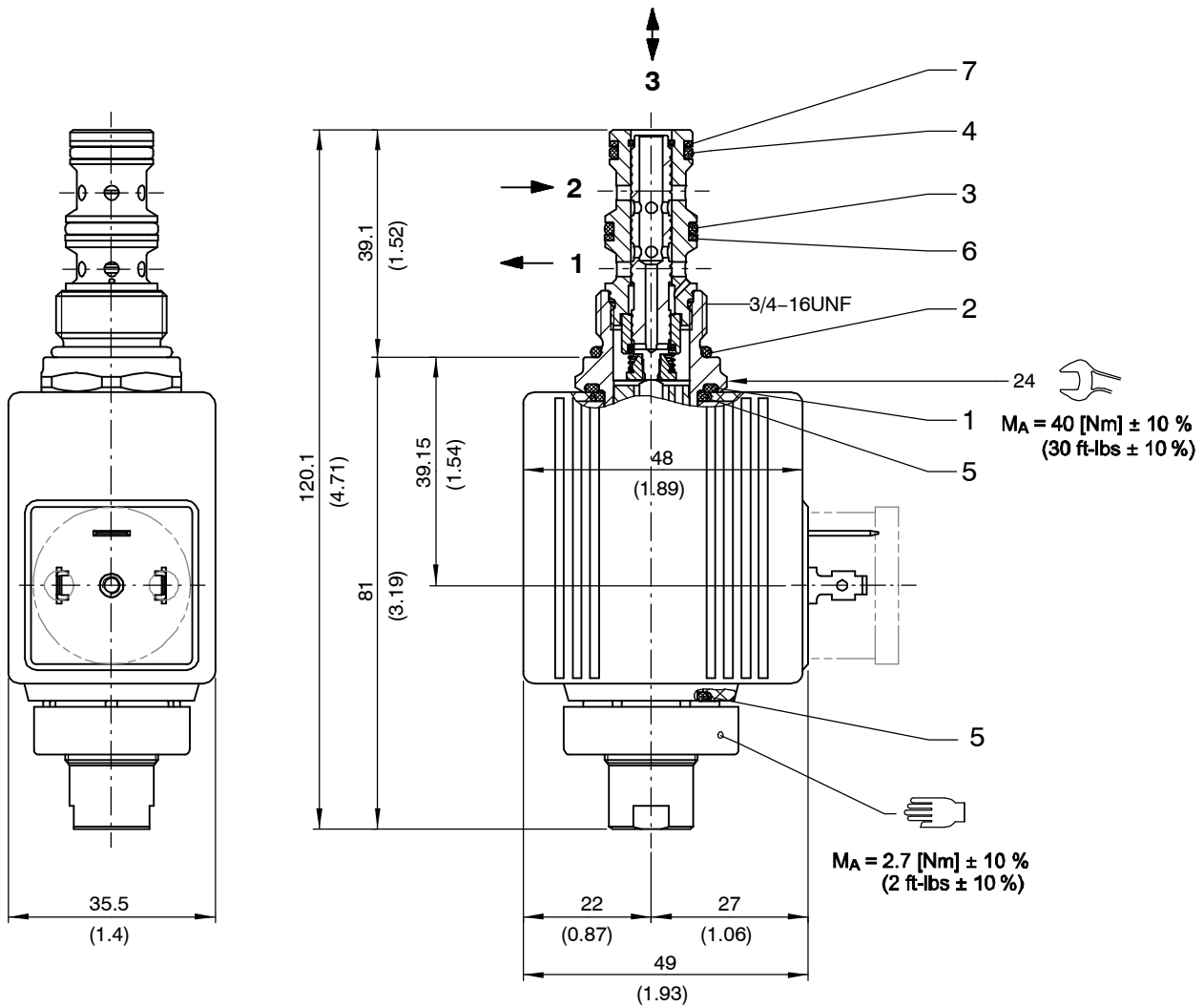


ATTENTION!

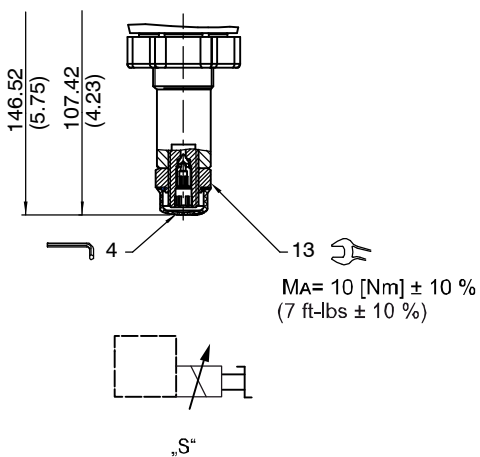
When installing in other cavity types, it is imperative to observe the terminal assignment.

6 Dimensions & sectional view

6.1 Standard without emergency operation option "O"



6.2 Option with emergency override "S"



Seal kit NBR no. DS-247-N ¹⁾

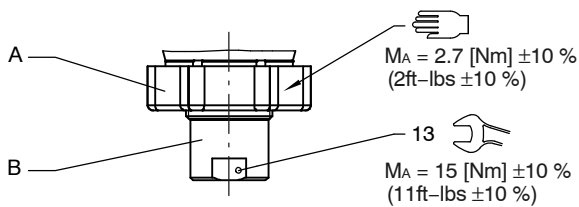
Item	Qty.	Description
1	1	O-ring \varnothing 18,00 x 2,00 FKM
2	1	O-ring no. 017 \varnothing 17,17 x 1,78 N90
3	1	O-ring no. 014 \varnothing 12,42 x 1,78 N90
4	1	O-ring no. 013 \varnothing 10,82 x 1,78 N90
5	2	O-ring \varnothing 16,00 x 2,00 FKM
6	1	Backup ring \varnothing 10.70 x 1.45 x 1.40 FI0751
7	1	Backup ring \varnothing 09.40 x 1.45 x 1.00 FI0751



IMPORTANT!

²⁾ Seal kit with FKM (Viton) seals no. DS-247-V

Air-bleeding for option "O"



Air-bleeding

If necessary, air can be purged from these proportional pressure-reducing cartridges by using the cap nut (Item B). The procedure is as follows:

A Knurled nut

B Cap nut

Steps:

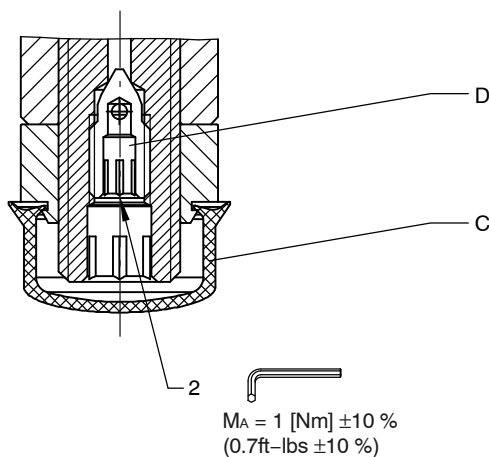
1. Set reduced pressure to minimum.
2. Slacken and remove the knurled nut.
3. Slacken the cap nut approx. 1.5 turns.

Caution:

Slackening the cap nut allows oil to spray out!

4. Slightly increase the reduced pressure several times and then lower it again until no more air escapes.
5. Tighten the cap nut.
6. Refit the knurled nut and tighten it.

Air-bleeding for option "S"



Integral air-bleeding

If necessary, air can be purged from these proportional pressure-reducing cartridges by using the integral air-bleed screw (Item D). The procedure is as follows:

C Protective cap

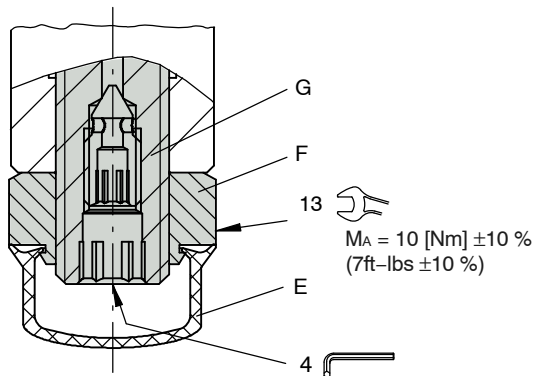
D Air-bleed screw

Steps:

1. Remove the protective cap.
2. Slacken the air-bleed screw approx. 2 turns.
3. Switch the pressure-reducing cartridge ON/OFF several times until no more air bubbles escape.
4. Tighten the air-bleed screw.
5. Fit the protective cap.

7 Emergency manual pressure setting

Optionally, the proportional pressure-reducing cartridges can be supplied with an integral manual pressure setting. If a proportional solenoid is faulty, for example, this manual pressure setting enables the required flow rate to be set mechanically up to max. 60% of the nominal pressure. This manual pressure setting is not designed for adjusting the pressure in a dynamic control mode.



- E Protective cap
- F Lock nut (13 A/F)
- G Adjusting spindle, pressure setting

Setting the pressure rate manually

Steps:

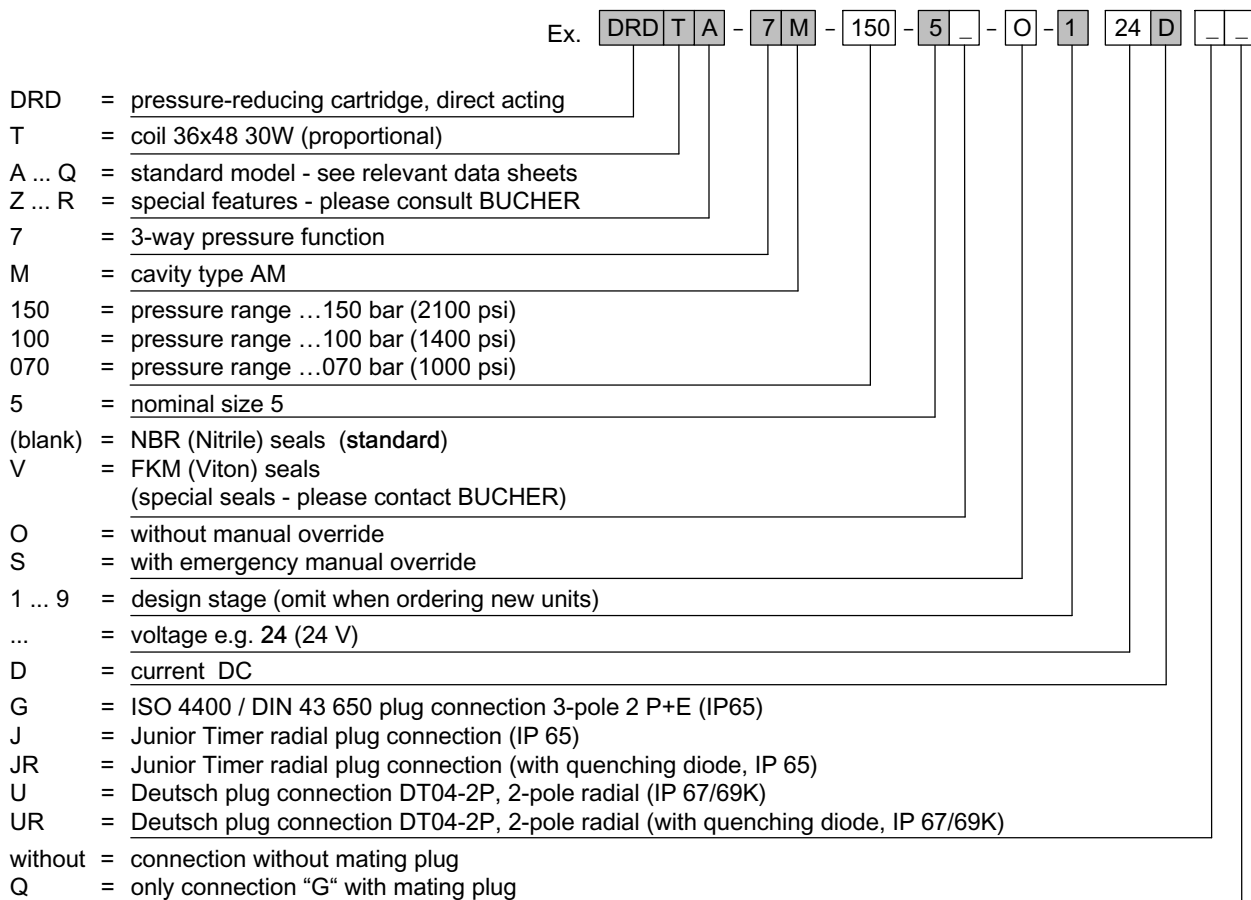
1. Remove the protective cap.
2. Slacken the lock nut (13 A/F).
3. Screw in (turn to right) the adjusting spindle (4 A/F) until the required pressure rate is set.
4. Tighten the lock nut (13 A/F).
5. Fit the protective cap.

Restoring the factory settings

Steps:

1. Solenoid de-energized.
2. Remove the protective cap.
3. Slacken the lock nut (13 A/F).
4. Unscrew the adjusting spindle (4 A/F) to its end-stop, then screw it in 2 turns.
5. Tighten the lock nut (13 A/F).
6. Fit the protective cap.

8 Ordering code



9 Related data sheets

Reference	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-040181	(i-33.11)	Cavity type AM
400-P-120212		Coil for solenoid valve, series 36X48/16.1
400-P-720111		Line-mounting body, type GAMA (G 3/8")
400-P-010101		MTTF _D values for hydraulic valves
400-TI-000041		Minimum distance of solenoid coils in proportional technology

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