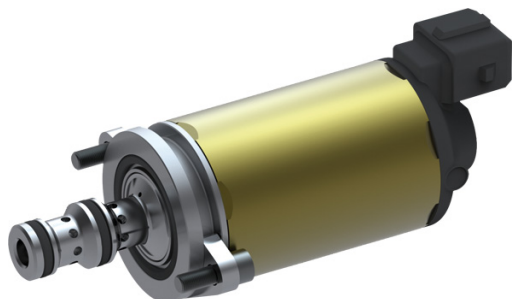


## Inverse Prop. 3-Way Pressure-Reducing Cart., Size 2...4

$Q_{\max} = 12 \text{ l/min}$ ,  $p_{\max} = 70 \text{ bar}$   
Direct acting, electrically operated  
Series DRDCA-7...



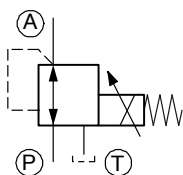
- Compact design offers space-saving installation
- Push-in cartridge for Bucher standard cavity type AGA
- Can be turned through 360° at installation
- Operated by a proportional solenoid
- Nominal pressure when solenoid de-energised (fail-safe function)
- 4 pressure ranges available
- Excellent stability over the whole pressure and flow range
- Coils protected against penetration by water
- Various plug-connector systems and voltages are available
- All exposed parts with zinc-nickel plating
- Can be fitted in a line-mounting body

### 1 Description

Series DRDCA-7... inverse proportional 3-way pressure-reducing cartridges with a compact solenoid system are direct acting, spool-type, push-in cartridges with a falling pressure-current characteristic and are available in sizes 2...4. They reduce the outlet pressure in A as a function of the control current signal and independently of the inlet pressure in P. In the initial position (solenoid de-energised) the connection P → A is open and the connection to tank A → T is closed. In control mode, the connection P → A remain open until the pressure in port A reaches the preset level. If the pressure rises above the preset level, the control spool opens the A → T connection until balance is attained. Four pressure ranges are available in order to obtain precise pressure settings over the whole of the required pressure range. The maximum operating pressure depends on the particular pressure range. These 3-way pressure-re-

ducing cartridges are predominantly used for reducing a system pressure in mobile and industrial applications. They are suitable for controlling larger directional valves, where they can be incorporated in the valve body or directly in the end covers, for example, and for controlling pumps and motors. The advantages are the small space requirement, 360° rotatability at installation, and easy installation of the plug-in cartridge thanks to the mounting clip. The compact solenoid system also offers an ideal price/performance ratio, which is vital for reducing operating costs and capital expenditures. All external parts of the cartridge are zinc-nickel plated to DIN 50 979 and are thus suitable for use in the harshest operating environments. If you intend to manufacture your own cavities or are designing a line-mounting installation, please refer to the section "Related data sheets".

### 2 Symbol



### 3 Technical data

General characteristics	Description, value, unit
Designation	Inverse proportional 3-way pressure-reducing cartridge
Design	direct acting, electrically operated
Mounting method	push-in cartridge with mounting clip for 2 cap screws, M4 x 12

General characteristics	Description, value, unit
Tightening torque	1.8 Nm $\pm$ 10 %
Size	nominal size 2...4, cavity type AGA
Weight	0.45 kg
Mounting attitude	unrestricted (preferably vertical, coil down)
Ambient temperature range	-25 °C ... +50 °C

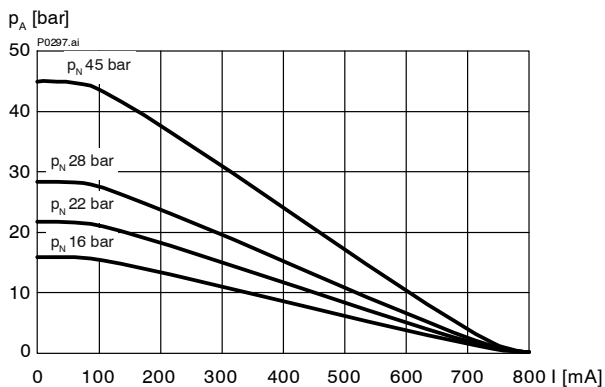
Hydraulic characteristics	Description, value, unit
Maximum operating pressure $p_{max}$ (Inlet pressure)	70 bar, pressure range "45" 50 bar, pressure range "28" 50 bar, pressure range "22" 40 bar, pressure range "16"
Flow range	...12 l/min
Nominal pressure ranges $p_N$ - model "45" - model "28" - model "22" - model "16"	...45 bar ...28 bar ...22 bar ...16 bar
Back pressure in T - static, not controlling - while controlling	$p_{max}$ 10 bar < 2 % $p_N$
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
Viscosity range	15...380 mm <sup>2</sup> /s (cSt), recommended 20...130 mm <sup>2</sup> /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 18/16/13

Electrical characteristics	Description, value, unit
Supply voltage	12 V DC, 24 V DC
Control current	12 V = 0...1500 mA, 24 V = 0...800 mA
Coil resistance R - cold value at 20 °C - cold value at -25 °C - max. warm value	12 V = 4.8 $\Omega$ / 24 V = 17.6 $\Omega$ 12 V = 4.0 $\Omega$ / 24 V = 14.5 $\Omega$ 12 V = 8.0 $\Omega$ / 24 V = 28.0 $\Omega$
Inductance Measured non-operated, at 0.1 mA (rms) / 1 kHz	12 V = 14 mH      24 V = 44 mH
Recommended PWM frequency (dither)	200 Hz
Hysteresis with PWM	4...6 % $I_N$
Reversal error with PWM	4...6 % $I_N$
Sensitivity with PWM	< 1 % $I_N$
Reproducibility with PWM	< 2 % $p_N$

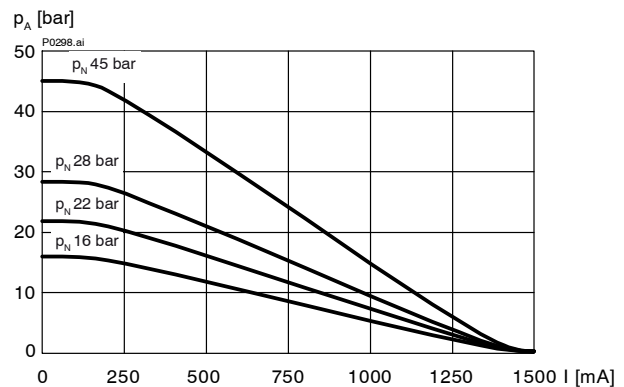
Electrical characteristics	Description, value, unit
Relative duty cycle	100 %
Nominal power consumption	max. 18 W
Protection class to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see "Ordering code" (with appropriate mating connector and proper fitting and sealing)
Electrical connection	3-pin square plug to ISO 4400 / DIN 43 650 (standard) for other connectors, see "Ordering code"

## 4 Performance graphs measured with oil viscosity 33 mm<sup>2</sup>/s (cSt)

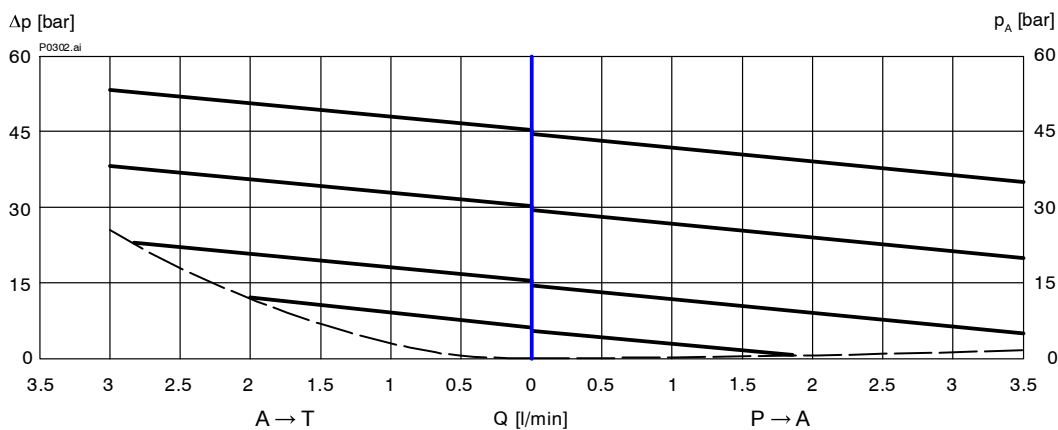
$p = f(I)$  Pressure adjustment characteristic



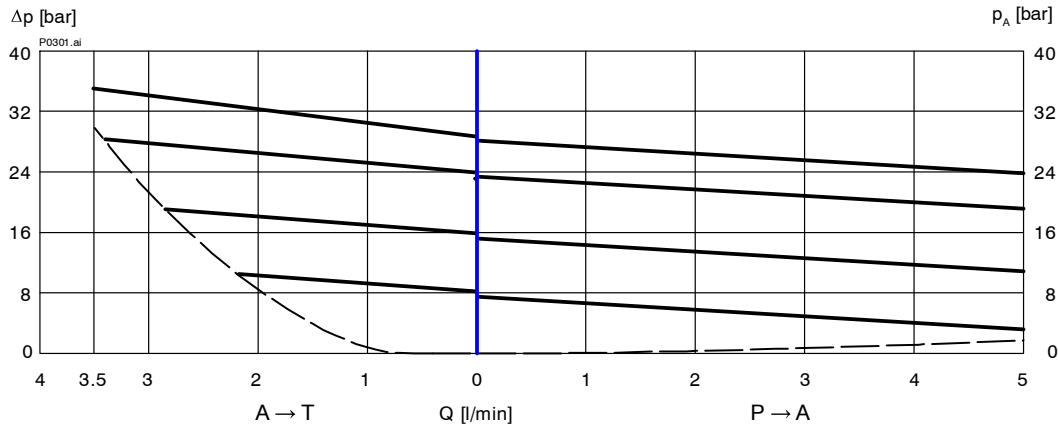
$p = f(I)$  Pressure adjustment characteristic



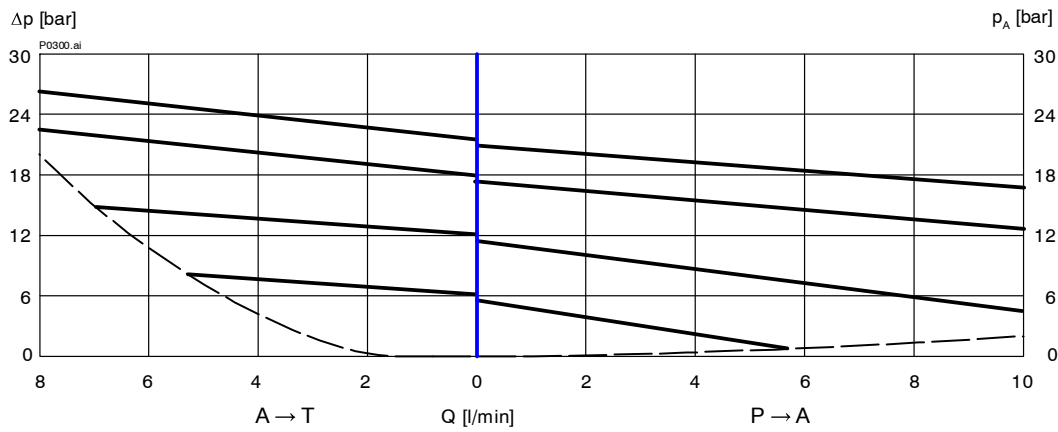
$p = f(Q)$  Pressure - Flow rate characteristic [DRDCA-7045...]



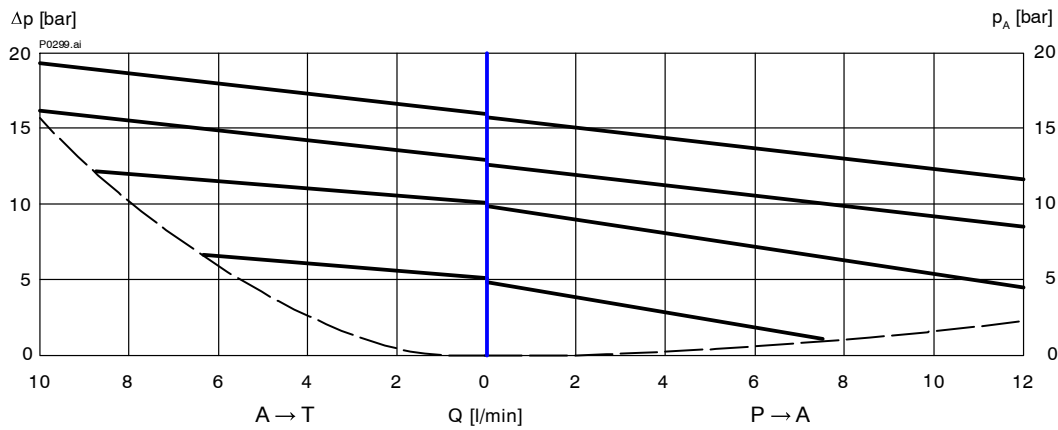
$p = f(Q)$  Pressure - Flow rate characteristic [DRDCA-7028...]



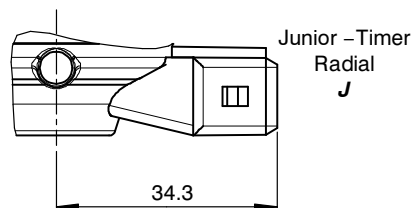
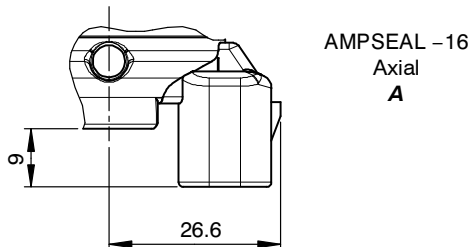
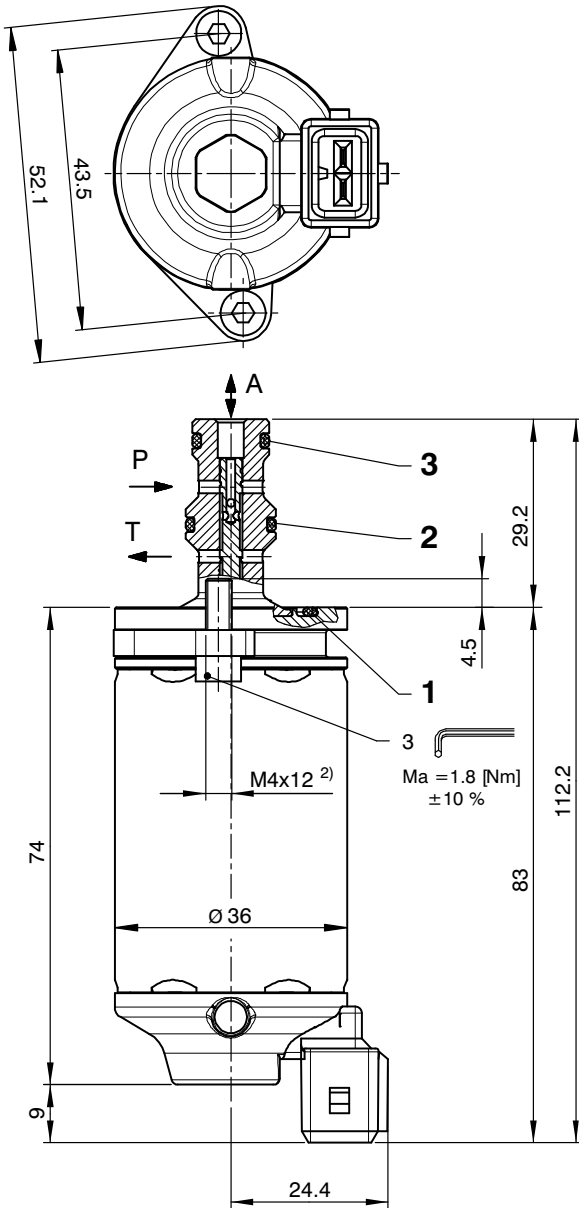
$p = f(Q)$  Pressure - Flow rate characteristic [DRDCA-7022...]



$p = f(Q)$  Pressure - Flow rate characteristic [DRDCA-7016...]



## 5 Dimensions & sectional view



## 6 Installation information



### IMPORTANT!

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.

### Seal kit NBR no. DS-154-N <sup>1)</sup>

Item	Qty.	Description
1	1	O-ring no. 021 $\varnothing 23,52 \times 1,78$ N90
2	1	O-ring no. 013 $\varnothing 10,82 \times 1,78$ N70
3	1	O-ring no. 012 $\varnothing 9,25 \times 1,78$ N70



### IMPORTANT!

- 1) Seal kit with FKM (Viton) seals, no. DS-154-V
- 2) Valve mounting bolts M4x12 (included in the delivery)

### 7 Ordering code

Ex. **DRD C A - 7 045 - 2 - 2 24 D -**

- DRD = pressure-reducing cartridge, direct acting, inverse type (pulling)
- C = compact solenoid (proportional)
- A ... Q = standard model - see relevant data sheets
- Z ... R = special features - please consult BUCHER
- 7 = pressure function, 3 way design
- 045 = pressure range ...45 bar
- 028 = pressure range ...28 bar
- 022 = pressure range ...22 bar
- 016 = pressure range ...16 bar
- 2 = nominal size 2 for pressure range 045
- 3 = nominal size 3 for pressure range 028
- 3 = nominal size 3 for pressure range 022
- 4 = nominal size 4 for pressure range 016
- (blank) = NBR (Nitrile) seals (standard)
- V = FKM (Viton) seals (special seals - please contact BUCHER)
- 1 ... 9 = design stage (omit when ordering new units)
- ... = voltage e.g. 24 (24 V)
- D = current DC
- J = Junior Timer radial plug connection (IP65)
- I = Junior Timer axial plug connection (IP65)
- A = AMPSEAL 16-axial plug connection (IP 65 / 67 / 69K)

} mating plug not supplied

for the following plug-variants, please consult Bucher:

- (blank) = ISO 4400 / DIN 43 650 mating plug
- D = Deutsch plug connection DT04-2P (IP 65 / 67 / 69K)
- F = flying leads (500 mm)

} mating plug not supplied

### 8 Related data sheets

Reference	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-040142		Cavity type AGA
400-P-712101		Line-mounting body, type GAAA (G 1/4")
400-P-510101		Amplifier unit for proportional valves (1-channel) PBS - 3A
400-P-511101	(P-3)	Amplifier card, 1-channel for valves with one solenoid, type SAN-535...

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