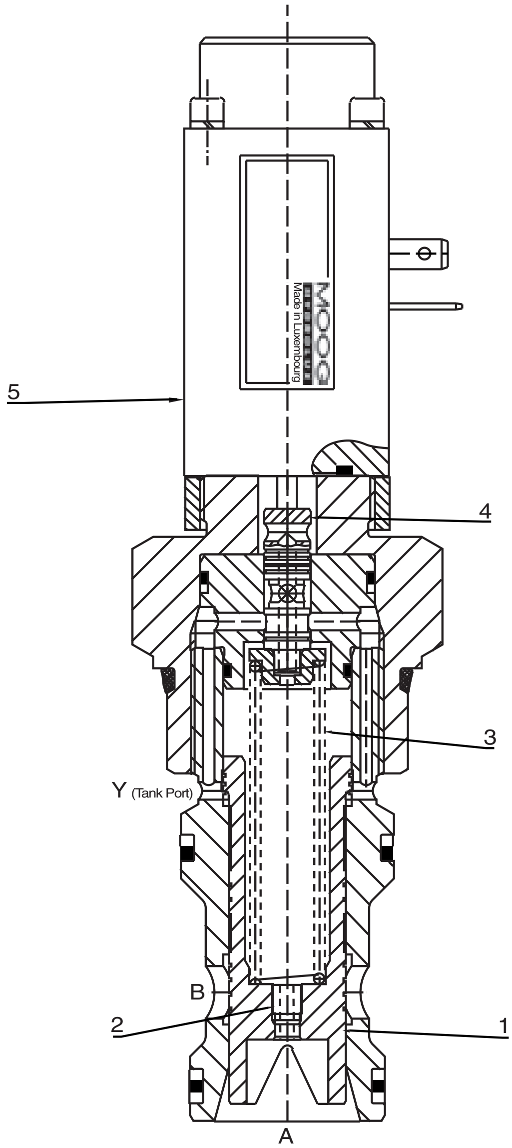
MOOG

Differential Proportional Flow Control Valve

DPCMEE 16 & 20

Table of Contents



DESCRIPTION:

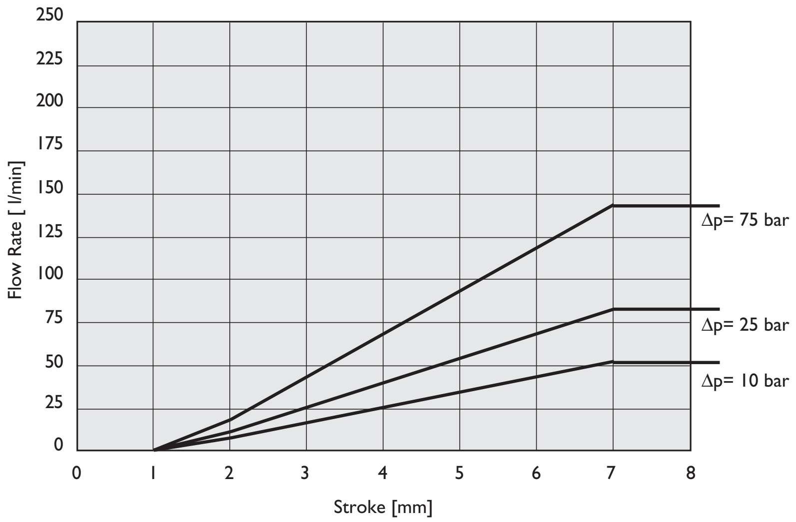
Moog Luxembourg's DPCMEE series differential proportional flow control valves are used to regulate flow from 'A' port to 'B' port. This valve uses a self-regulating hydraulic design for control of flow rate by a current-controlled PWM signal. This screw-in cartridge type valve is designed to fit in SAE style cavity with UNF thread for use in manifolds. It can also be used in conjunction with 2- or 3-way pressure compensators as a 2- or 3- way pressure compensated flow control valve.

OPERATING PRINCIPLE:

This valve is in a normally closed condition. In the closed condition the pressure of the fluid at the 'A' port is sensed through the orifice (2) and acts on the main spool (1). Since the pilot spool (4) is a pressure balanced design, the main spool is held closed due to the hydraulic pressure and the spring (3) force. When a current signal is applied to the valve, the proportional solenoid (5) extends. The force of the solenoid (5), which is directly proportional to the applied signal, pushes the pilot spool (4) downwards. At this time the pilot spool (4) connects the pilot side flow to the tank port internally, thus creating a pressure drop across the orifice (2). This will allow the main spool to move upwards, allowing flow from 'A' port to 'B' port. As the main spool (1) opens, the forces become unbalanced between the spring (3) and solenoid (5) acting on the pilot spool (4). At which time this force balance is reestablished, the main spool (1) stops moving. This allows the valve to be used for proportionally controlling the flow by steplessly varying the input current signal.

General Data	Value	Unit	Specifications
Designation			Differential-proportional flow control valve
Type Designation			Refer to Ordering Information page 13
Mode of Construction			Cartridge-Screw-in-Valve
Mounting Style			Manifold Mounting
Branch Circuit Connection			Drillings in the Manifold
Mounting Dimensions		mm	See page 11 and 12
Mounting Position			Any
Flow Direction			A → B
Ambient Temperature Range	min.	°C	-25
	max.	°C	+60
Working Pressure			
Input	min.	bar	5
	max.	bar	350
Outlet	min.	bar	0
	max.	bar	350
Fluid Temperature Range	min.	°C	-20
	max.	°C	+80
Viscosity Range	min.	cSt	2,8
	max.	cSt	380
Operational Viscosity	Vn	cSt	35
Connection Bore = Size (mm)			See page 11 and 12
Weight of Typical Assembly		kg	See page 10
Nominal Flow	Qn	l/min	See Page 6 and 8
Filtration	Maximum permissible degree of contamination of fluid to NAS 1638 Class 9. We there fore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.		

Performance Curve DPCMEE16S8 – Cone CK



Formula:

To calculate flow at different pressure drops, use the following formula:

$$Qx = Q\Delta p_{10} \sqrt{\frac{\Delta px}{10}}$$

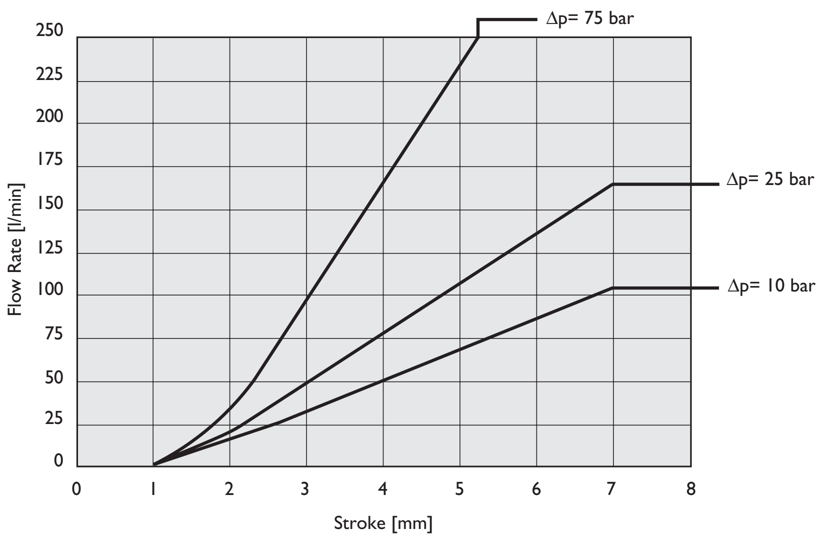
Where:

Qx = Flow at pressure drop Δpx-lpm

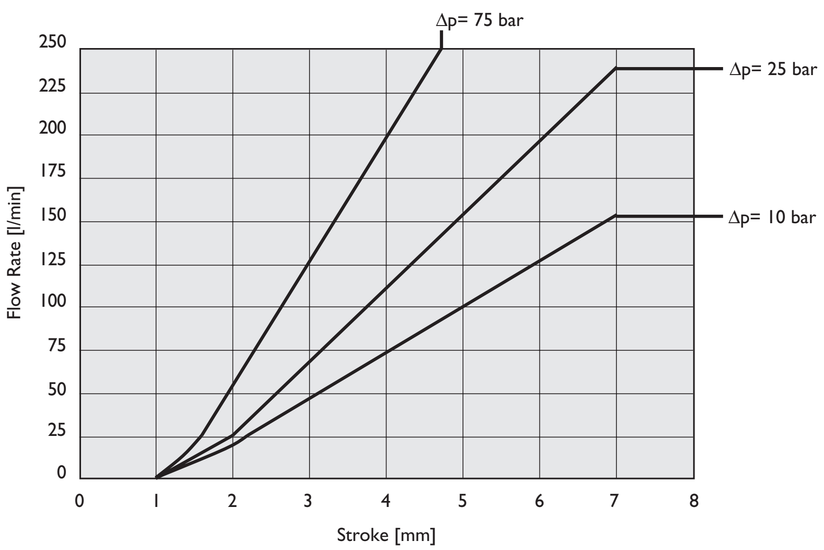
$Q\Delta p_{10}$ = Flow at 10 bar pressure drop (from the curves)

Δpx = Pressure drop in bar at which flow is calculated

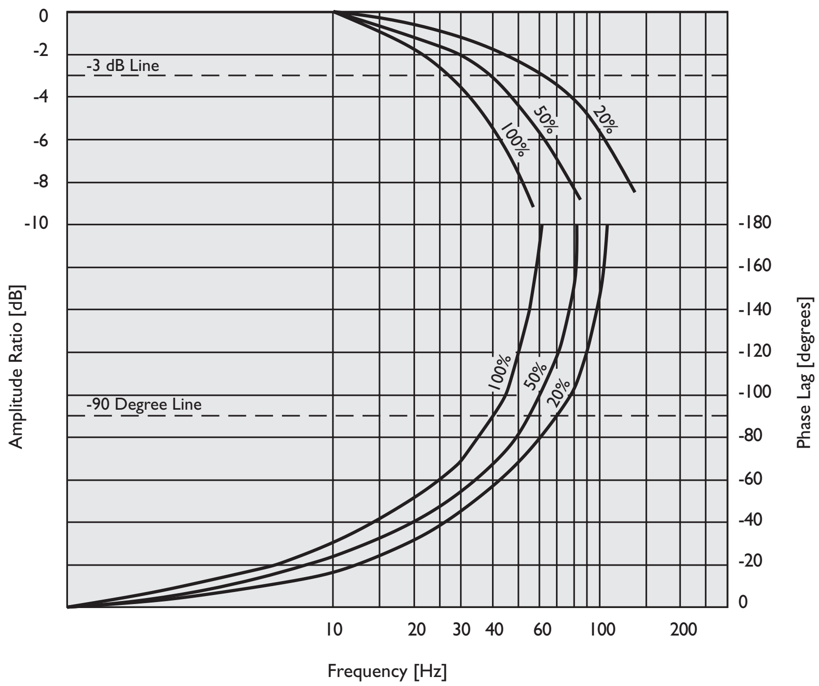
Performance Curves DPCMEE16S8 – Cone EK



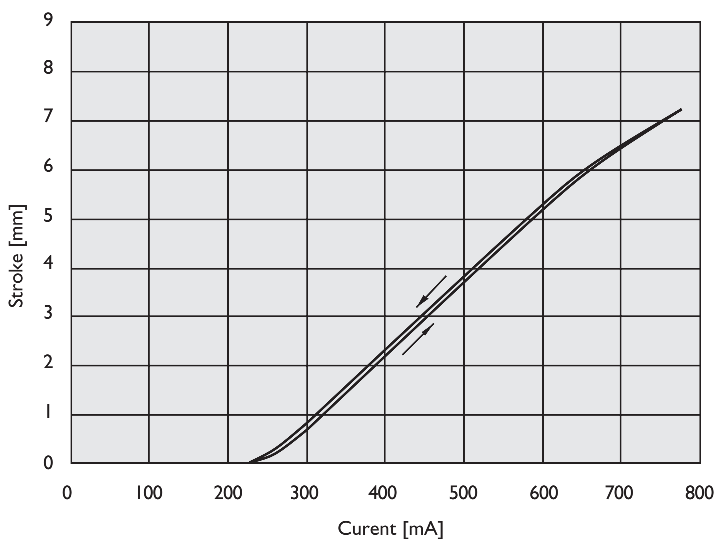
Performance Curves DPCMEE16S8 – Cone DK



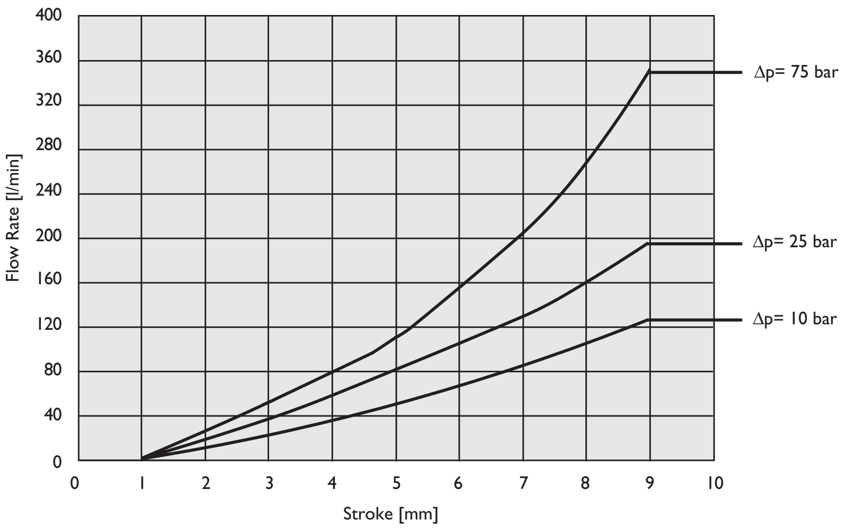
Frequency Response – DPCMEE16S8



Current vs Stroke Characteristic Curve DPCMEE16S8



Performance Curves – DPCMEE20S8 – Cone CK



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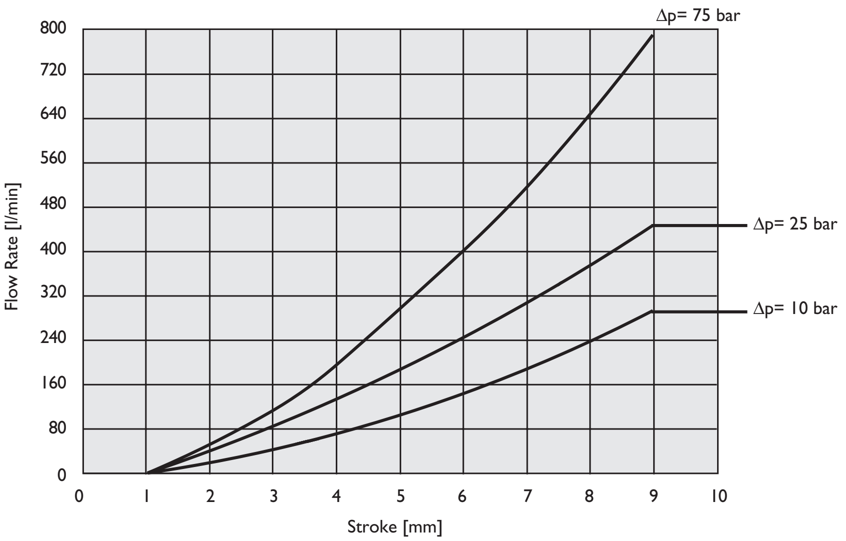
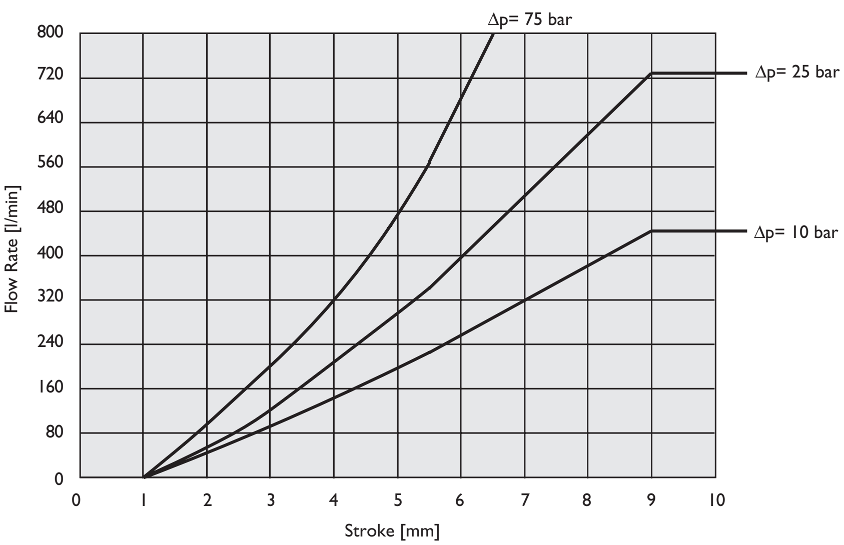
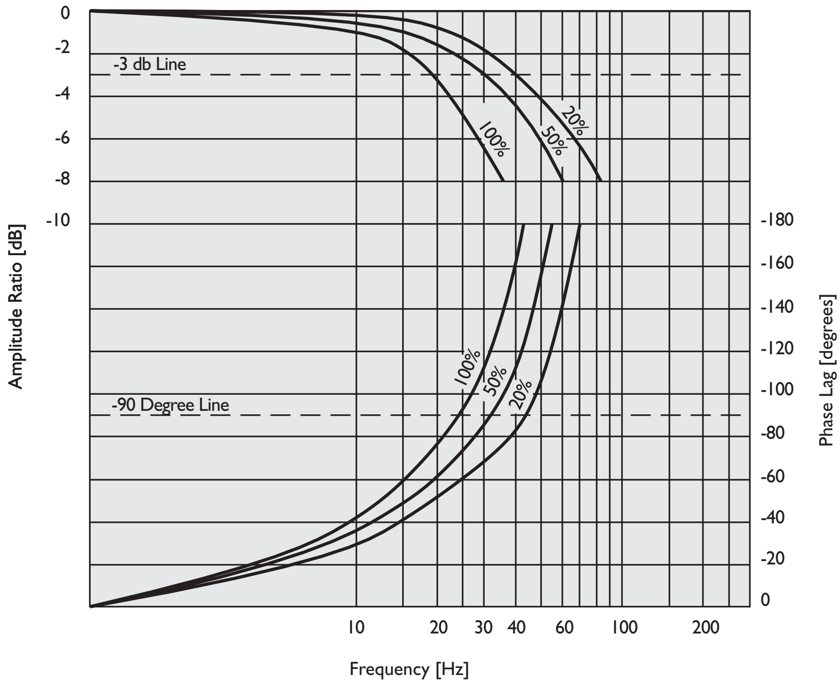
Performance Curves – DPCMEE20S8 – Cone EK



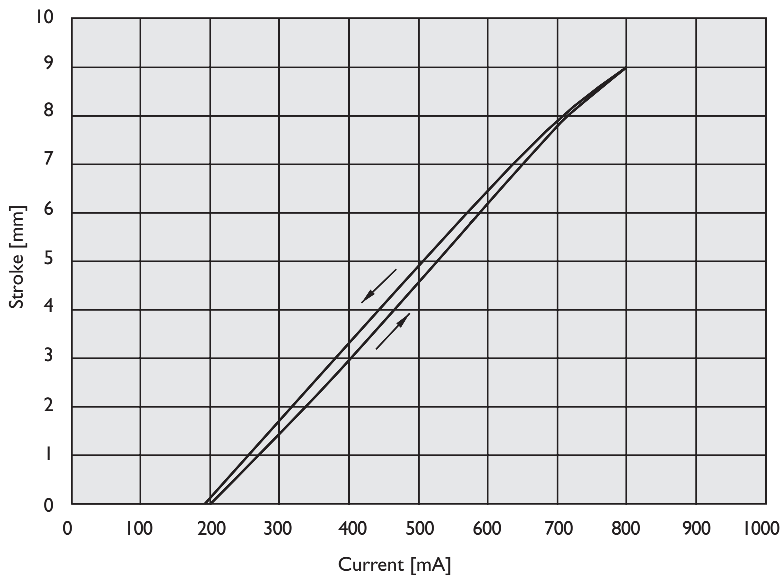
Performance Curves – DPCMEE20S8 – Cone DK

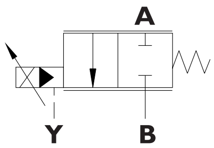
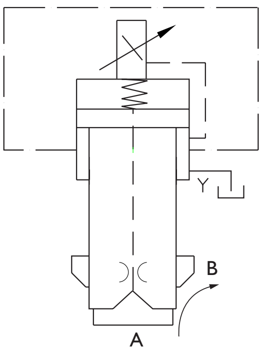


Frequency Response – DPCMEE20S8



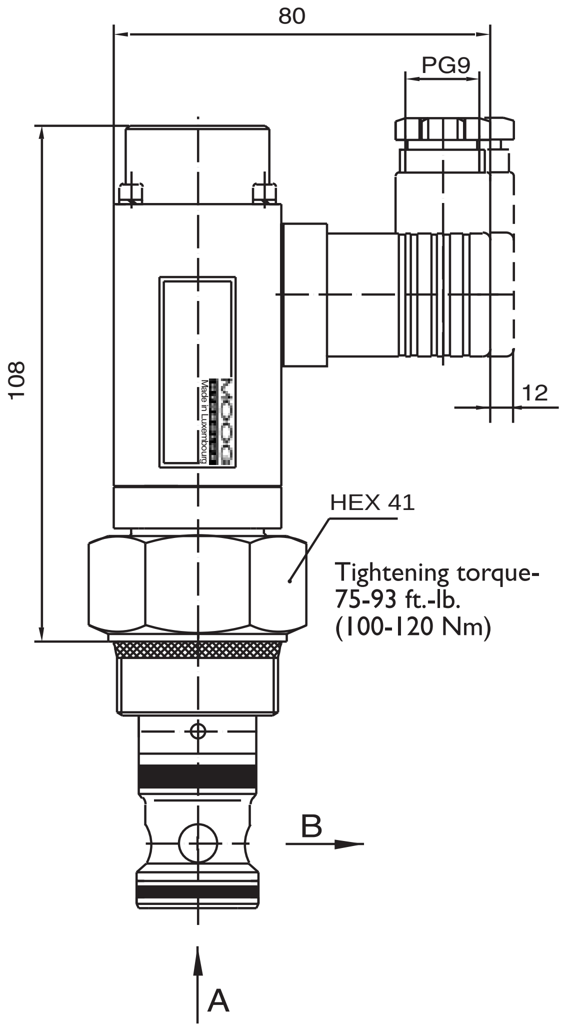
Current vs Stroke Characteristic Curve DPCMEE20S8



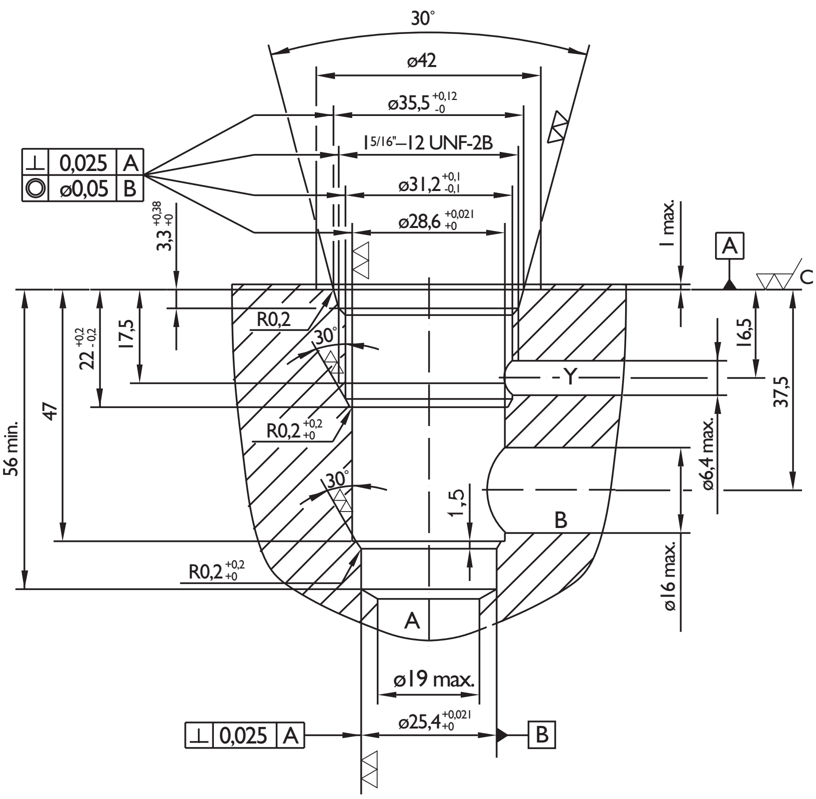
Symbol	Function	Nominal Size*	Weight [kg]	Part Designation	Part Number
 	Proportional Throttle	16	1.2	DPCMEE16S8CK0ZS3A	XDB10424-000-01
				DPCMEE16S8CK0ZS3B	XDB10108-000-01
				DPCMEE16S8EK0ZS3A	XDB10423-000-01
				DPCMEE16S8EK0ZS3B	XDB10107-000-01
				DPCMEE16S8DK0ZS3A	XDB10425-000-01
				DPCMEE16S8DK0ZS3B	XDB10109-000-01
		20	1.5	DPCMEE20S8CK0ZS3A	XDB10462-000-01
				DPCMEE20S8CK0ZS3B	XDB10110-000-01
				DPCMEE20S8EK0ZS3A	XDB10461-000-01
				DPCMEE20S8EK0ZS3B	XDB10111-000-01
				DPCMEE20S8DK0ZS3A	XDB10463-000-01
				DPCMEE20S8DK0ZS3B	XDB10112-000-01

*Nominal size refers to the Standard Industrial "Short Series" screw-in cavities. Refer to pages 11 & 12 for cavity details.

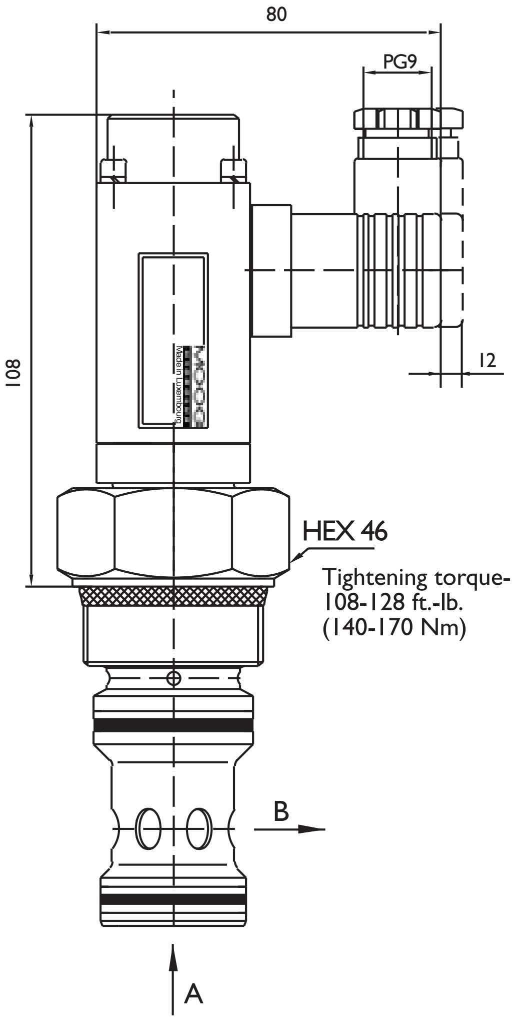
Valve Dimensions - DPCMEE16S8



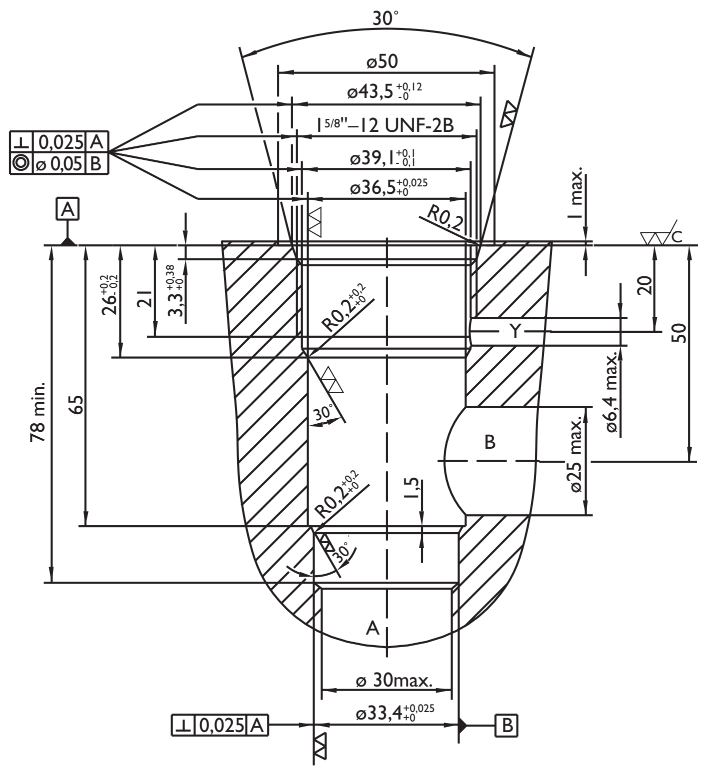
Cavity Dimensions - DPCMEE16S8



Valve Dimensions - DPCMEE20S8



Cavity Dimensions - DPCMEE20S8



	DP	CME	E		S	8			Z	S	3			/	

Type of Seals

–	Viton seals std.
M	MIXED VITON and PU seal
N	BUNA – N SEALS
S	Special seals on request

Valve Type

DP	Differential Proportional Flow control

Function

CME	Electrical infinite Remote control

Mounting

E	Manifold mounting

Size

Nominal size	16
	20

Connection

S	SAE thread

Series

8	Screw-in valve

Type of Cones & Nominal Flow @ 6 bar pressure drop – l/min

Nominal Size – 16		Nominal Size – 20	
CK	40	CK	100
EK	80	EK	200
DK	120	DK	300
GK	Special form (consult factory)	GK	Special form (consult factory)

Flow Rate of the Cone – l/min

0	Standard flow
xxx	Max flow for the cone in l/min ex: 170 = Max flow, 170 l/min

Opening pressure

Z	Not applicable

Pilot connection

S	'X' through cone 'Y' through mounting surface

Operation

3	Stepless stroke with proportional control

Solenoid supply voltage

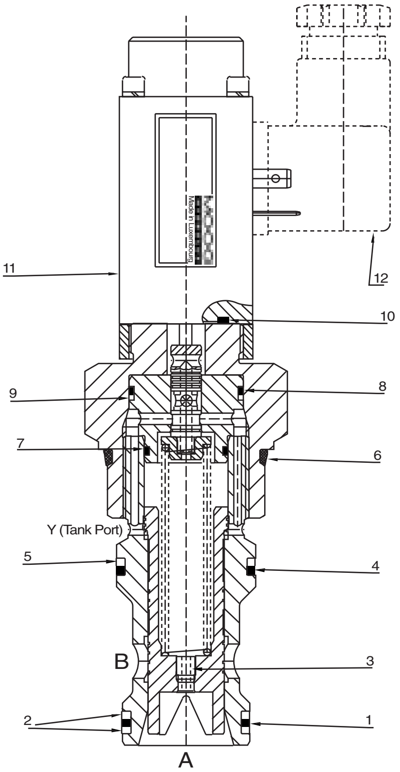
A	12VDC
B	24VDC

Electrical connection (Optional)

1	Cube plug recommended by DIN 43650
2	Large cube plug with cable strain relief

Special modification

Spare Parts



<table>
<tr><th colspan="5">PARTS LIST</th></tr>
<tr><th rowspan="2">Position #</th><th rowspan="2">Quantity</th><th rowspan="2">Designation</th><th colspan="2">Part Number</th></tr>
<tr><th>DPCMEE16S8</th><th>DPCMEE20S8</th></tr>
<tr><td>–</td><td>1</td><td>Seal Kit</td><td>XEB12544-000-00</td><td>XEB13696-000-00</td></tr>
<tr><td rowspan="2">1</td><td>1</td><td>O-ring, Viton 21.95 x 1.78</td><td>X980-02020</td><td></td></tr>
<tr><td>1</td><td>O-ring, Viton 28.24 x 2.62</td><td></td><td>X980-02122</td></tr>
<tr><td rowspan="2">2</td><td>2</td><td>Back-up Ring</td><td>X783-00062</td><td></td></tr>
<tr><td>2</td><td>Back-up Ring</td><td></td><td>X783-00077</td></tr>
<tr><td>3</td><td>1</td><td>Orifice M5 x 5 x 1.0</td><td colspan="2">X784-90510</td></tr>
<tr><td rowspan="2">4</td><td>1</td><td>O-ring, Viton 23.47 x 2.62</td><td>X980-02119</td><td></td></tr>
<tr><td>1</td><td>O-ring, Viton 31.42 x 2.62</td><td></td><td>X980-02124</td></tr>
<tr><td rowspan="2">5</td><td>1</td><td>Back-up Ring</td><td>X783-00030</td><td></td></tr>
<tr><td>1</td><td>Back-up Ring</td><td></td><td>X783-00078</td></tr>
<tr><td rowspan="2">6</td><td>1</td><td>O-ring, Viton 29.82 x 2.62</td><td>X980-02123</td><td></td></tr>
<tr><td>1</td><td>O-ring, Viton 37.77 x 2.62</td><td></td><td>X980-02128</td></tr>
<tr><td rowspan="2">7</td><td>1</td><td>O-ring, Viton 12.42 x 1.78</td><td>X980-02014</td><td></td></tr>
<tr><td>1</td><td>O-ring, Viton 18.77 x 1.78</td><td></td><td>X980-02018</td></tr>
<tr><td rowspan="2">8</td><td>1</td><td>O-ring, Viton 20.35 x 1.78</td><td>X980-02019</td><td></td></tr>
<tr><td>1</td><td>O-ring, Viton 26.70 x 1.78</td><td></td><td>X980-02023</td></tr>
<tr><td rowspan="2">9</td><td>1</td><td>Back-up Ring</td><td>X783-00043</td><td></td></tr>
<tr><td>1</td><td>Back-up Ring</td><td></td><td>X783-00079</td></tr>
<tr><td rowspan="2">10</td><td>1</td><td>O-ring, Viton 18.77 x 1.78</td><td>X980-02018</td><td></td></tr>
<tr><td>1</td><td>O-ring, Viton 18.77 x 1.78</td><td></td><td>X980-02018</td></tr>
<tr><td rowspan="2">11</td><td>1</td><td>Prop. Solenoid - 12 V DC</td><td colspan="2">X788-10126</td></tr>
<tr><td>1</td><td>Prop. Solenoid - 24 V DC</td><td colspan="2">X788-32202</td></tr>
<tr><td rowspan="6">12*</td><td>1</td><td>Plug-in Connector w/o LED, DIN 43650 / ISO 4400 (PG9)-Black</td><td colspan="2">X798-00004</td></tr>
<tr><td>1</td><td>Plug-in Connector w/o LED, DIN 43650 / ISO 4400 (PG9)-Grey</td><td colspan="2">X798-00005</td></tr>
<tr><td>1</td><td>Big Plug-in Connector w/o LED, DIN 43650 / ISO 4400 (PG11)-Black</td><td colspan="2">XEB16580-000-00</td></tr>
<tr><td>1</td><td>Big Plug-in Connector w/o LED, DIN 43650 / ISO 4400 (PG11)-Grey</td><td colspan="2">XEB16577-000-00</td></tr>
<tr><td>1</td><td>Big Plug-in Connector with LED 24VDC and free wheeling, DIN 43650 / ISO 4400 (PG11)-Black</td><td colspan="2">XEB16581-000-00</td></tr>
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Recommended Amplifiers*

<table>
<tr><td rowspan="6">–</td><td rowspan="6">1</td><td>HAN 209 - 10 - 08
(for use with 24VDC supply voltage coils only) - Eurocard style 100 x 160 mm</td><td>X798-02005</td></tr>
<tr><td>HAN 209 - 10 - 16
(for use with 12VDC supply voltage coils only) - Eurocard style 100 x 160 mm</td><td>X798-02006</td></tr>
<tr><td>SKDHD32S -
Card Holder for above.</td><td>X798-02013</td></tr>
<tr><td>STV1010 - Plug-in box IP65 rated (for use with 24 VDC supply voltage coils only)
104 x 45 x 51 mm</td><td>X798-02060</td></tr>
<tr><td>STV1010 - Plug-in box IP65 rated (for use with 12 VDC supply voltage coils only)
104 x 45 x 51 mm</td><td>X798-02061</td></tr>
<tr><td>Snap-on module EM1020 (only for use with 24VDC supply voltage coil models)
79 x 74 x 22.5</td><td>X798-02031</td></tr>
</table>

*OPTIONAL – Not part of delivery.

Australia
Brazil
China

Denmark
England
Finland
France

Germany
India
Ireland
Italy

Japan
Korea
Luxembourg
Philippines
Singapore
Spain
Sweden
USA

MOOG

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E-mail: info.luxembourg@moog.lu

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