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# Electrohydraulic Motion Controls

Proportional Directional & Pressure Control Valves  
Servovalves, Electronics, Accessories

Catalog MSG14-2550/US

April 2019



ENGINEERING YOUR SUCCESS.

**General Description**

Series D1FB\*EE series with explosion proof solenoids is based on the standard D1FB series. The specific solenoid design allows the usage in hazardous environments. The explosion proof class is

CE  $\text{Ex}$  II 2 G  
 Ex e mb II T4 Gb

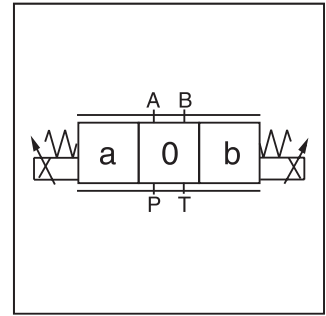
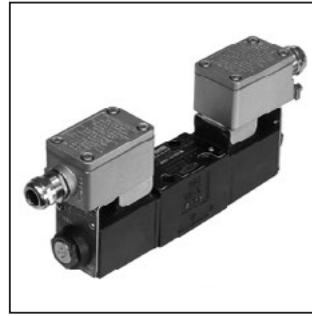
for use in zone 1 and 2 (conform to ATEX).

Additionally the solenoids have IECEx conformity.

The parameters can be saved, changed and duplicated in combination with the digital power amplifier PWD00A-400 (to be used in an explosion proof cabinet or outside of the hazardous area).

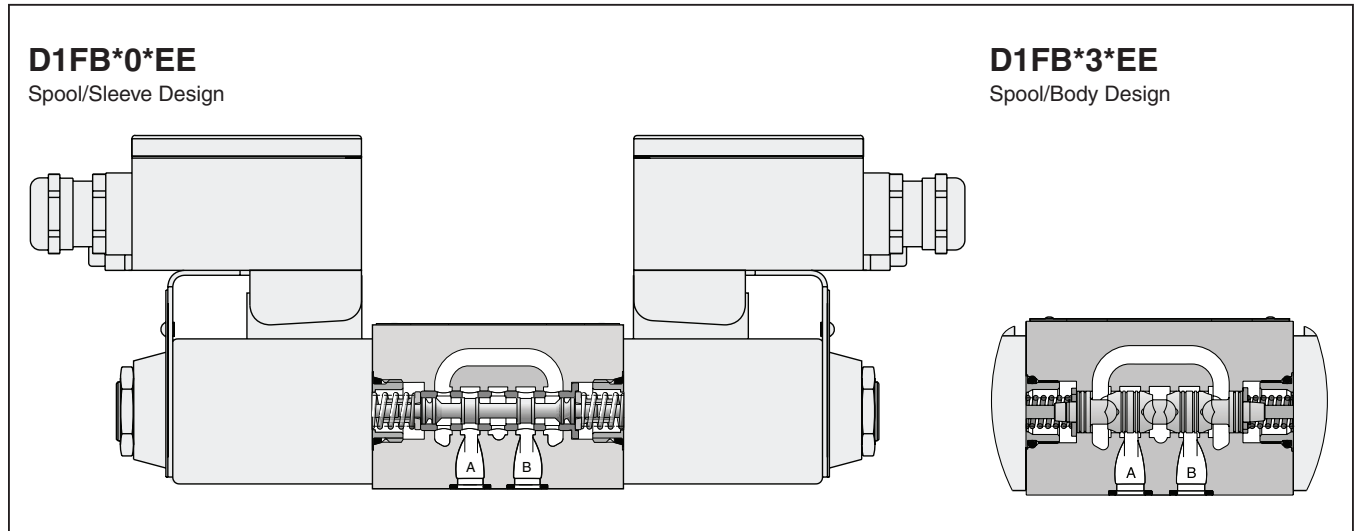
The valve parameters can be edited with the common ProPxD software.

The D1FB valves can be ordered with spool/sleeve de-sign (D1FB\*0) for maximum precision as well as spool/body design (D1FB\*3) for high nominal flow – see functional limit curves for maximum flow capability.



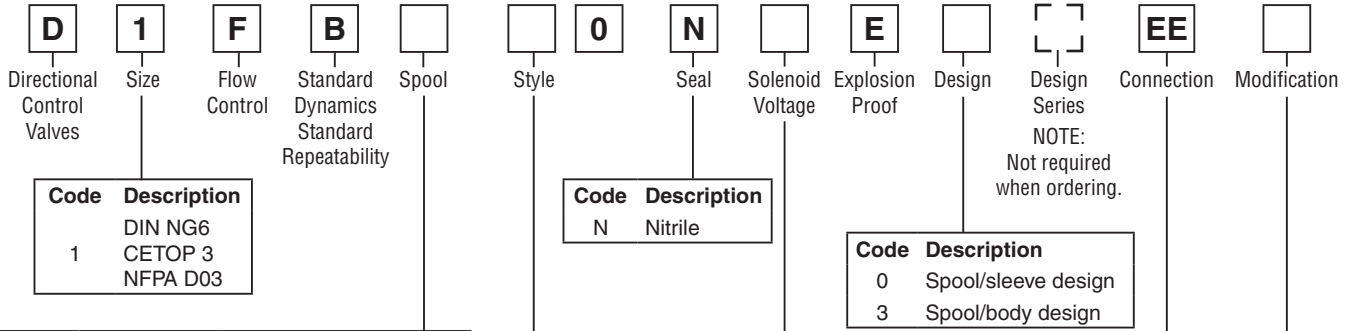
**Features**

- Spool/sleeve and spool/body
- High repeatability from valve to valve
- Low hysteresis
- Manual override
- Optional: coil to permit ambient temperature up to +60°C (+140°F), modification XG371



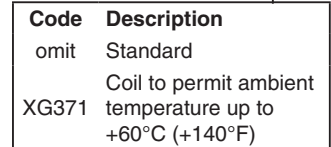
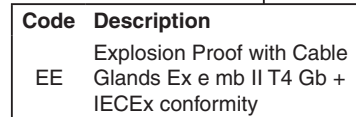
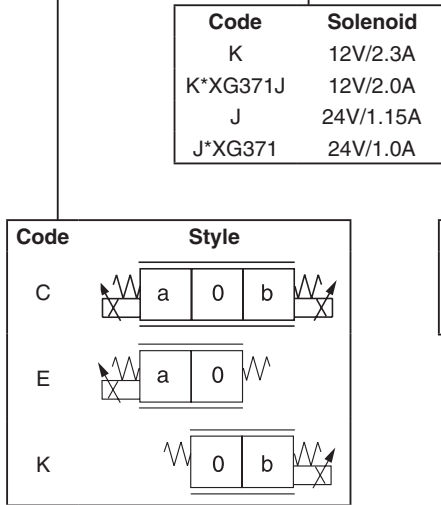
**WARNING:** This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).  
 A01\_Cat2500.indd, ddp, 04/19

**A**



**D1FB\*0\*EE: Spool/Sleeve Design**

Code	Spool	Flow LPM (GPM) at Δp 5 Bar (72.5 PSI) per metering edge
E01H E01F E01C		20 (5.3) 12 (3.2) 6 (1.6)
E02H E02F E02C		20 (5.3) 12 (3.2) 6 (1.6)
E03H E03F E03C		20 (5.3) 12 (3.2) 6 (1.6)
B31H B31F	$Q_B = Q_A/2$ 	20/10 (5.3/2.6) 12/6 (3.2/1.6)
B32H B32F	$Q_B = Q_A/2$ 	20/10 (5.3/2.6) 12/6 (3.2/1.6)



**D1FB\*3\*EE: Spool/Body Design**

Code	Spool	Flow LPM (GPM) at Δp 5 Bar (72.5 PSI) per metering edge
E01K E01H E01F		30 (7.9) 20 (5.3) 10 (2.6)
E02K E02H E02F		30 (7.9) 20 (5.3) 10 (2.6)
B31K B31H B31F	$Q_B = Q_A/2$ 	30/15 (7.9/3.96) 20/10 (5.3/2.6) 12/6 (3.2/1.6)
B32K B32H B32F	$Q_B = Q_A/2$ 	30/15 (7.9/3.96) 20/10 (5.3/2.6) 12/6 (3.2/1.6)

**Bolt Kit:**  
 BK375 (4) M5x30

**Weight:**  
 2 Solenoids 3.5 kg (7.7 lbs.)  
 1 Solenoid 2.5 kg (5.5 lbs.)

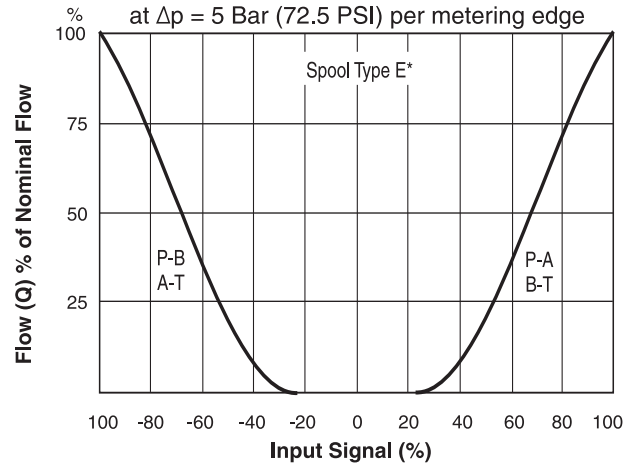
General				
Design	Direct operated proportional DC valve			
Actuation	Proportional solenoid			
Size	NG06/CETOP 03/NFPA D03			
Mounting Interface	DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting Position	Unrestricted			
Ambient Temperature	[°C]	-20...+40 (-4°F...+104°F); XG371: -20...+60 (-4°F...+140°F)		
MTTF <sub>D</sub> Value	[years]	150		
Vibration Resistance	[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27		
Hydraulic				
Maximum Operating Pressure	[Bar]	Ports P, A, B 350 Bar (5076 PSI); Port T 210 Bar (3046 PSI)		
Maximum Pressure Drop PABT / PBAT	[Bar]	350 Bar (5076 PSI)		
Fluid	Hydraulic oil as per DIN 51524...51535, other on request			
Fluid Temperature	[°C]	-20...+40 (-4°F...+104°F); XG371: -20...+60 (-4°F...+140°F)		
Viscosity Permitted	[cSt] / [mm <sup>2</sup> /s]	20...400 (93...1854 SSU)		
Viscosity Recommended	[cSt] / [mm <sup>2</sup> /s]	30...80 (139...371 SSU)		
Filtration	ISO 4406 (1999) 18/16/13			
Nominal Flow at Δp=Bar (72.5 PSI) per Control Edge *	[LPM]	D1FB*0*EE (Spool/Sleeve)		D1FB*3*EE (Spool/Body)
		6 LPM (1.6 GPM) 12 LPM (3.2 GPM) 20 LPM (5.3 GPM)	10 LPM (2.6 GPM) 20 LPM (5.3 GPM) 30 LPM (7.9 GPM)	
Leakage at 100 Bar (1450 PSI)	[ml/min]	<50		<60
Overlap	[%]	25, electrically normalized at 10 (see flow characteristics)		
Static / Dynamic				
Step Response at 100% Step	[ms]	30		30
Hysteresis	[%]	<4		<6
Temperature Drift Solenoid Current	[%/K]	<0.02		
Electrical				
Duty Ratio	[%]	100		
Protection Class	CE (Ex) II 2 G, Ex e mb II T4 Gb, IP66 (plugged and mounted correctly)			
Solenoid	Code J	Code J*XG371	Code K	Code K*XG371
Supply Voltage	[V]	24	24	12
Current Consumption	[A]	1.15	1.0	2.3
Resistance	[Ohm]	12.0	12.0	3.0
Solenoid Connection	Box with M20x1.5 entry for cable glands. Solenoid identifications per ISO 9461.			
Wiring Minimum	[mm <sup>2</sup> ]	3x1.5 recommended		
Wiring Length Maximum	[m]	50 (164 ft.) recommended		

With electrical connections the protective conductor (PE ⚡) must be connected according to the relevant regulations.

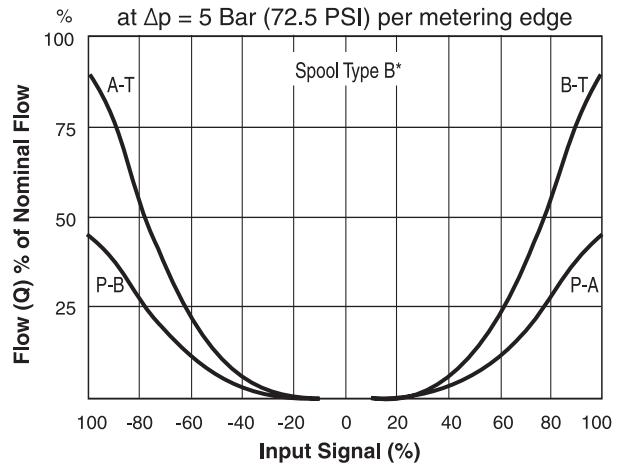
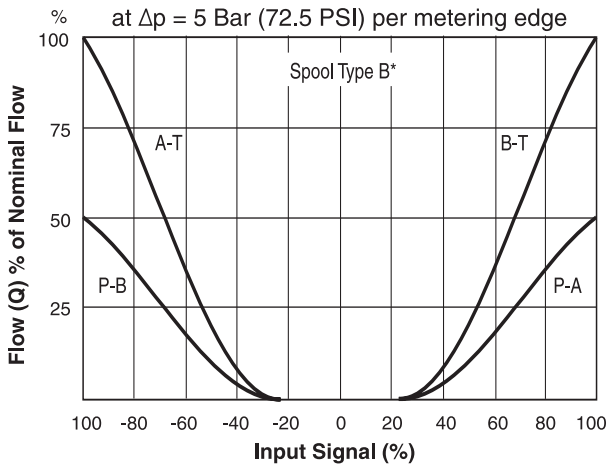
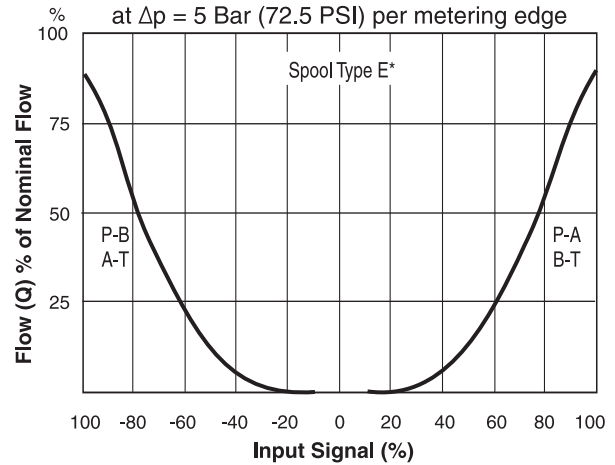
\* Flow rate for different Δp per control edge:  $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$



**D1FB\*0\*EE**

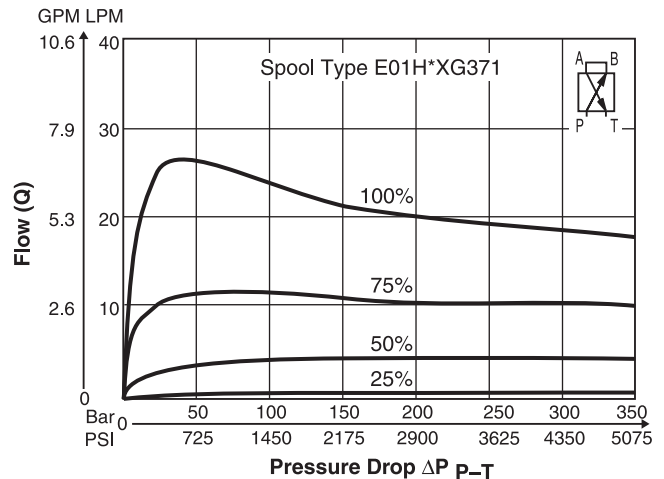
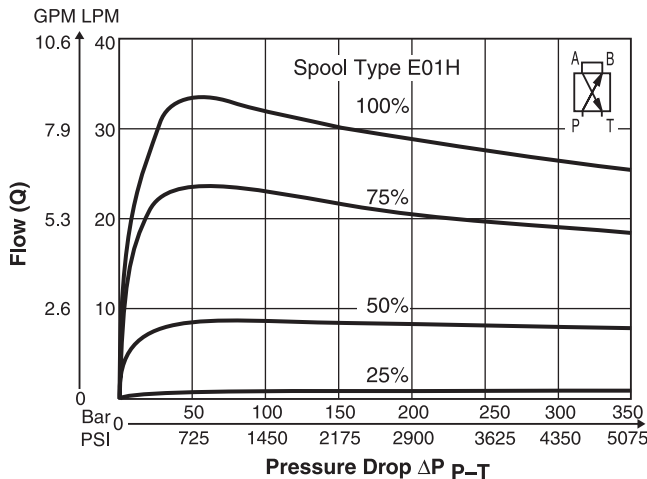


**D1FB\*0\*EEXG371**



**Functional Limits**

At 25%, 50%, 75% and 100% command signal (symmetric flow). At asymmetric flow a reduced flow limit has to be considered – typically approx. 10% lower.

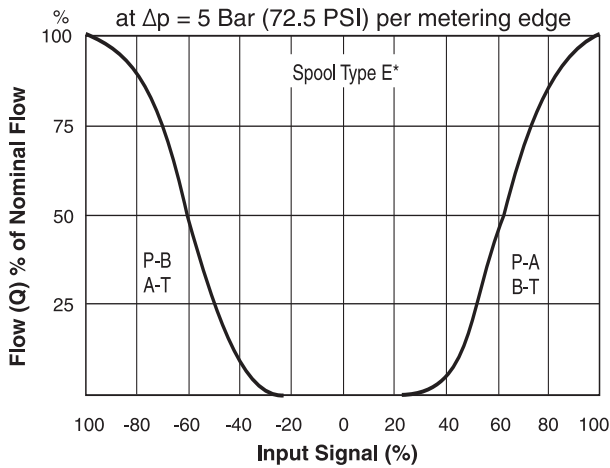


All performance curves measured with HLP46 at 50°C (122°F).

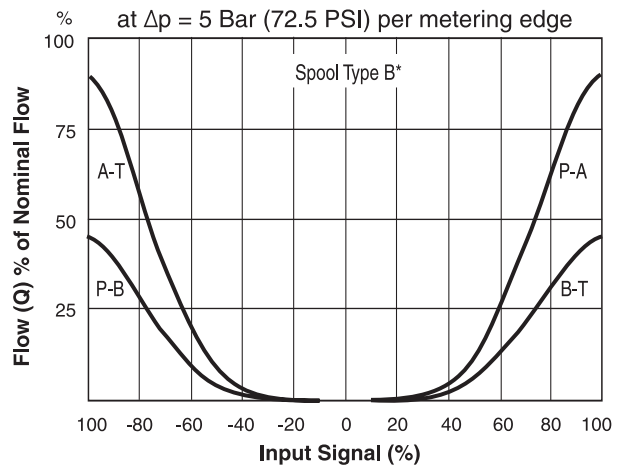
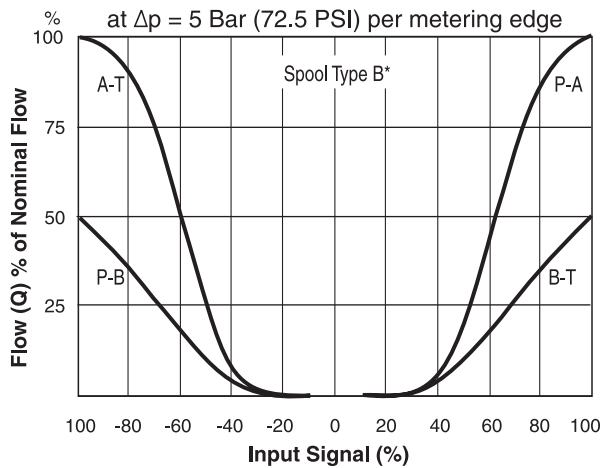
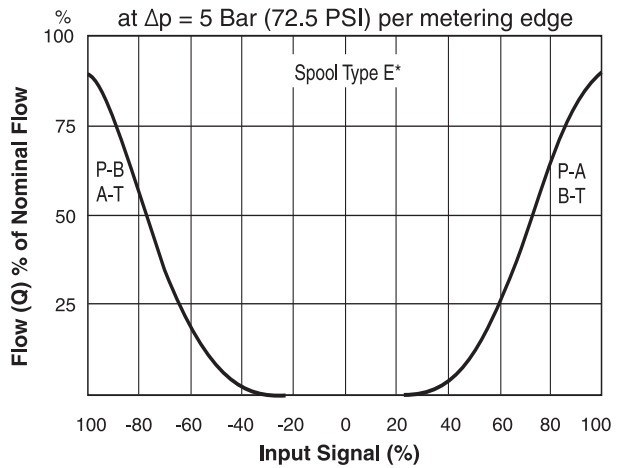
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**D1FB\*3\*EE**

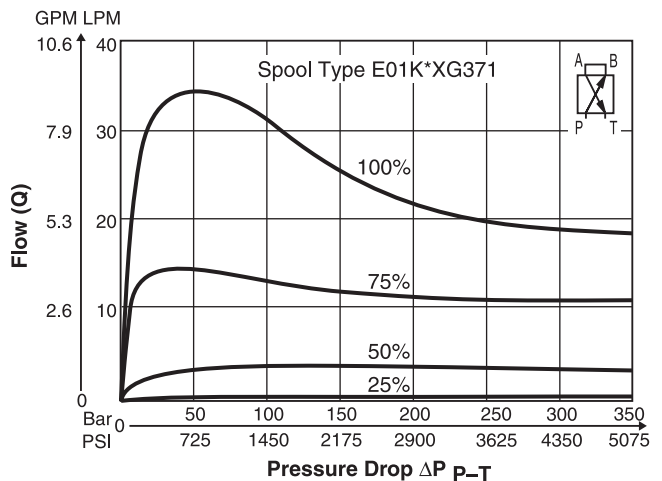
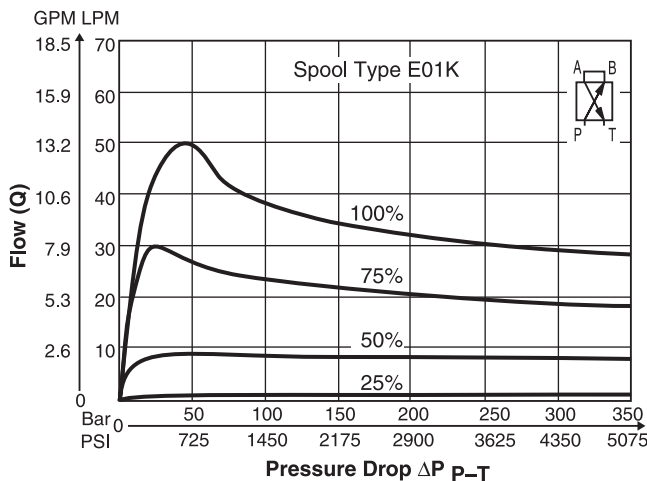


**D1FB\*3\*EEXG371**



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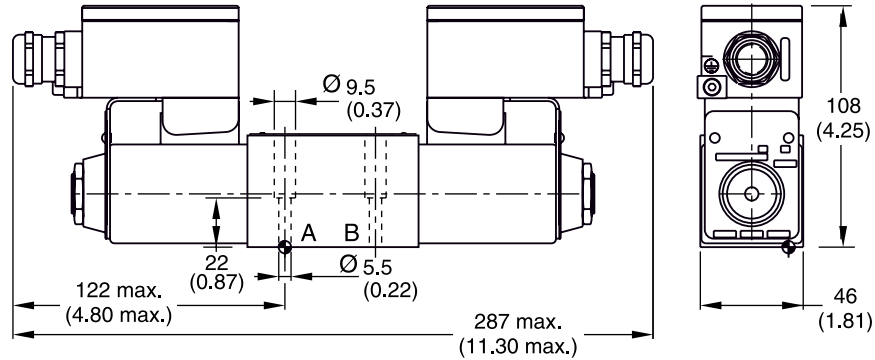
All performance curves measured with HLP46 at 50°C (122°F).

**Dimensions**

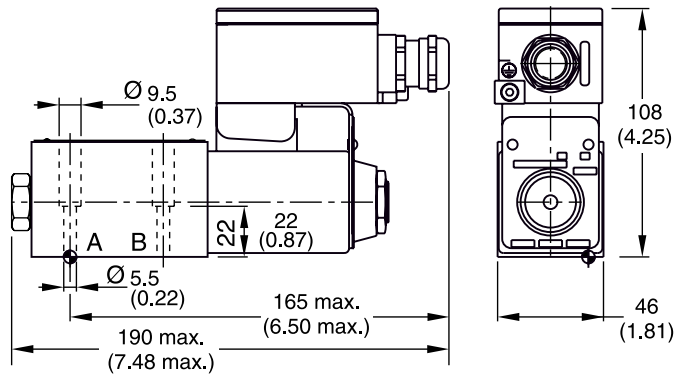
Inch equivalents for millimeter dimensions are shown in (\*\*)



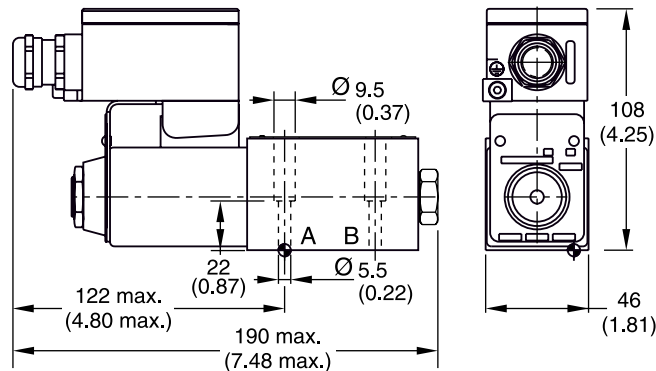
**D1FB\*C\*EE**





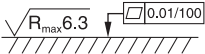


**D1FB\*K\*EE**



**D1FB\*E\*EE**



Surface Finish	 Kit	 	Seal  Kit
	BK375	4x M5x30 ISO 4762-12.9	7.6 Nm (5.6 lb.-ft.)
			Nitrile: SK-D1FB