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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 Ex II 2 G
 Ex e mb II T4 Gb

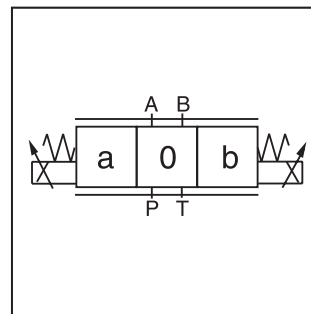
for use in zone 1 and 2 (conform to ATEX).

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.



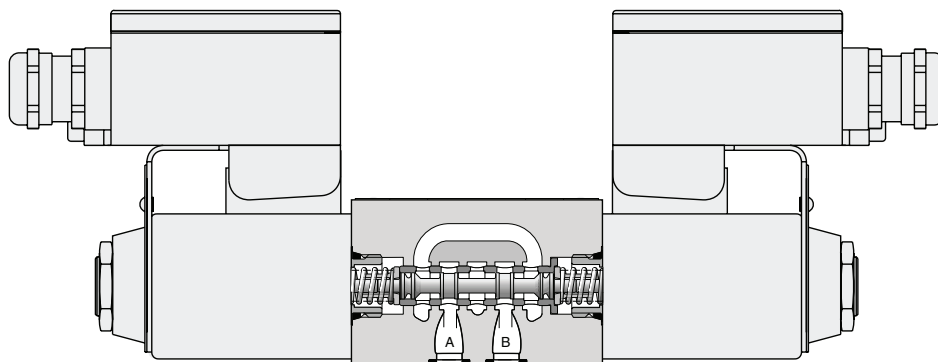
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Features

- 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

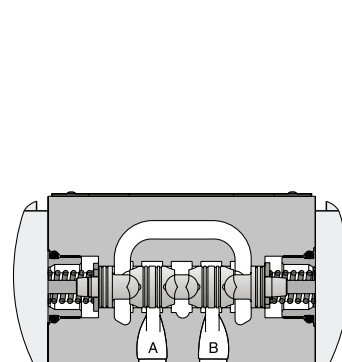
D1FB*0*EE

Spool/Sleeve Design



D1FB*3*EE

Spool/Body Design








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.

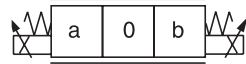
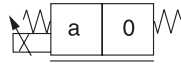
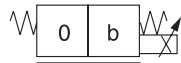
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D	1	F	B			0	N		E			EE															
Directional Control Valves	Size	Flow Control	Standard Dynamics Standard Repeatability	Spool	Style		Seal	Solenoid Voltage	Explosion Proof	Design	Design Series	Connection	Modification														
<table><tr><th>Code</th><th>Description</th></tr><tr><td>1</td><td>DIN NG6 CETOP 3 NFPA D03</td></tr></table>				Code	Description	1	DIN NG6 CETOP 3 NFPA D03	<table><tr><th>Code</th><th>Description</th></tr><tr><td>N</td><td>Nitrile</td></tr></table>				Code	Description	N	Nitrile	<table><tr><th>Code</th><th>Description</th></tr><tr><td>0</td><td>Spool/sleeve design</td></tr></table>				Code	Description	0	Spool/sleeve design	NOTE: Not required when ordering.			
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0	Spool/sleeve design																										





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)

Code	Solenoid
K	12V/2.3A
K*XG371J	12V/2.0A
J	24V/1.15A
J*XG371	24V/1.0A

Code	Style
C	
E	
K	


Code	Description
EE	Explosion Proof with Cable Glands Ex e mb II T4 Gb + IECEx conformity


Code	Description
omit	Standard
XG371	Coil to permit ambient temperature up to +60°C (+140°F)

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

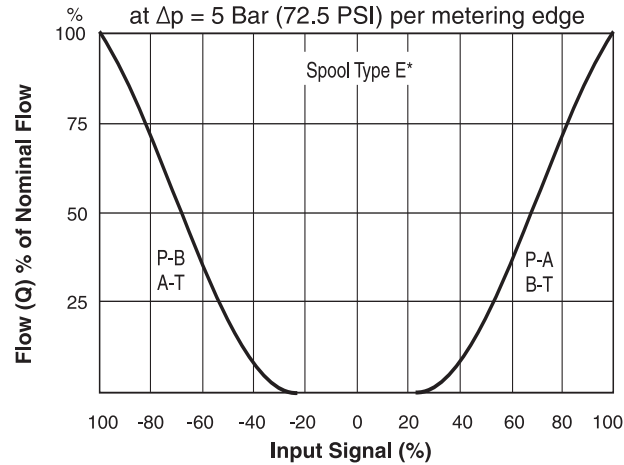
Weight:
2 Solenoids 3.5 kg (7.7 lbs.)
1 Solenoid 2.5 kg (5.5 lbs.)

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 _D 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] / [mm²/s]	20...400 (93...1854 SSU)	
Recommended		[cSt] / [mm²/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  II 2 G, Ex e mb II T4 Gb, IP66 (plugged and mounted correctly)		
Solenoid		Code J	Code J*XG371	Code K
Supply Voltage		[V]	24	12
Current Consumption		[A]	1.15	2.3
Resistance		[Ohm]	12.0	3.0
Solenoid Connection		Box with M20x1.5 entry for cable glands. Solenoid identifications per ISO 9461.		
Wiring Minimum		[mm²]	3x1.5 recommended	
Wiring Length Maximum		[m]	50 (164 ft.) recommended	

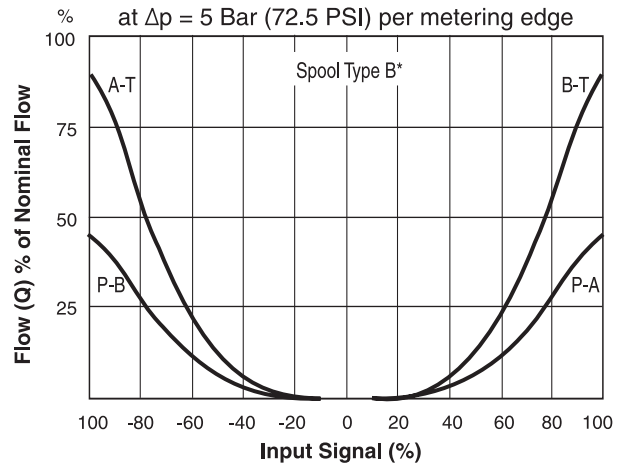
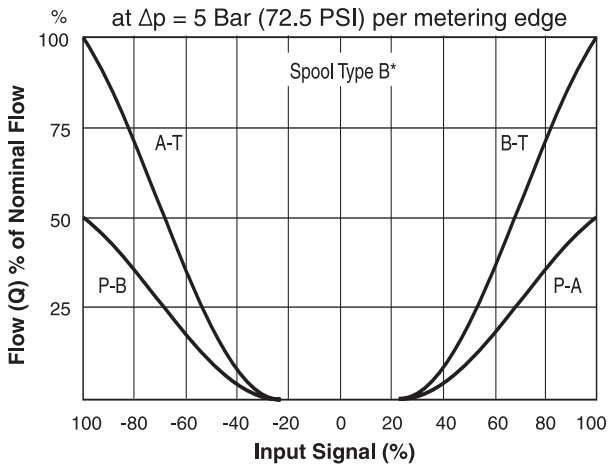
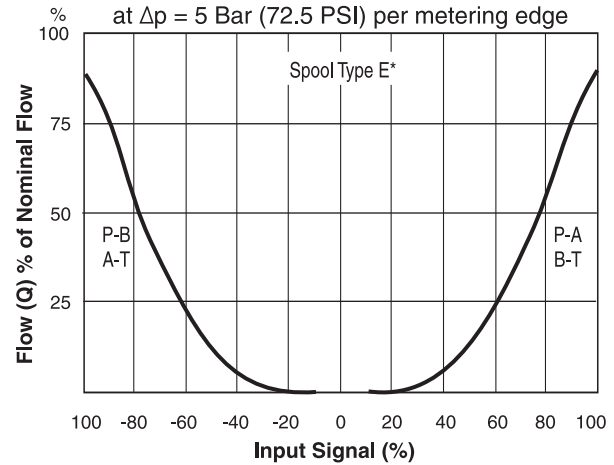
With electrical connections the protective conductor (PE ) must be connected according to the relevant regulations.

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

D1FB*0*EE

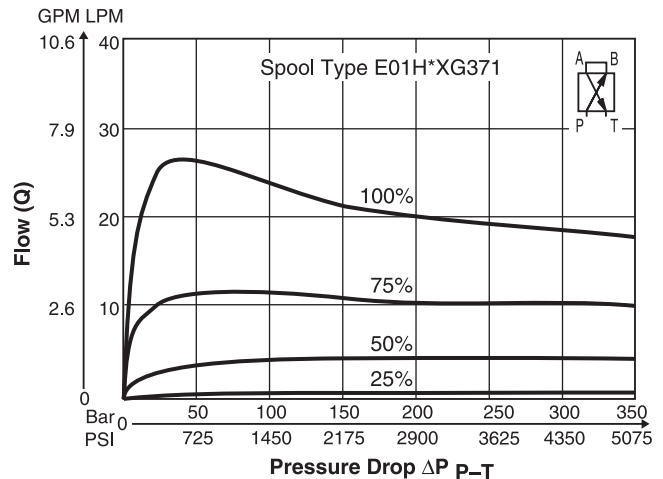
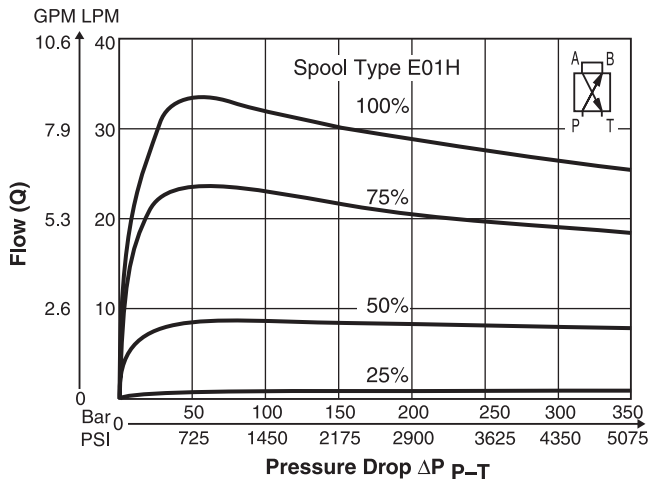


D1FB*0*EEEXG371



Functional Limits

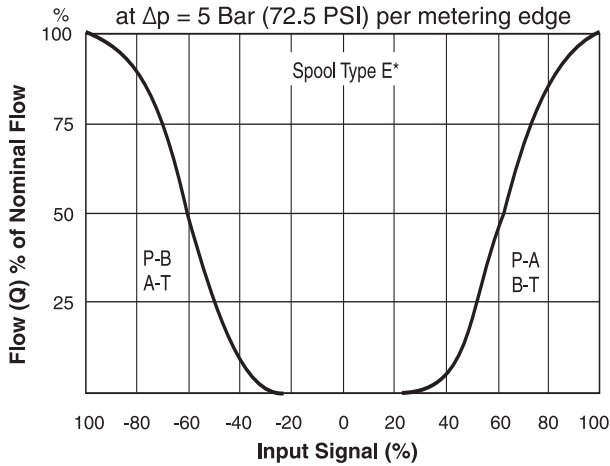
At 25%, 50%, 75% and 100% command signal (symmetric flow). At asymmetric flow a reduced flow limit has to be considered – typically approx. 10% lower.



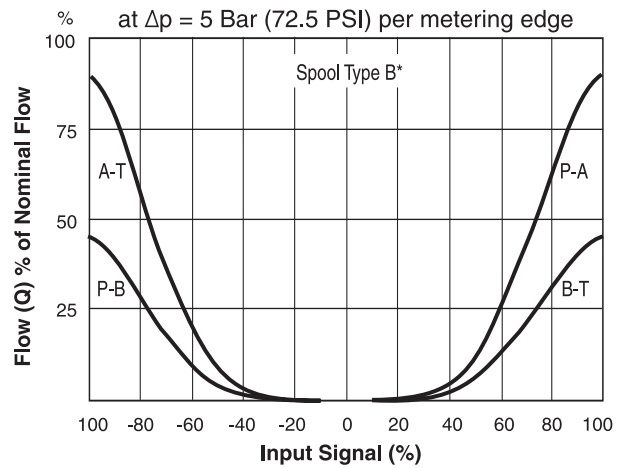
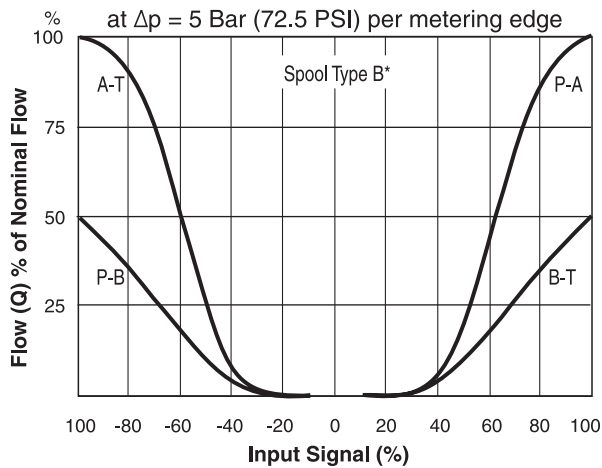
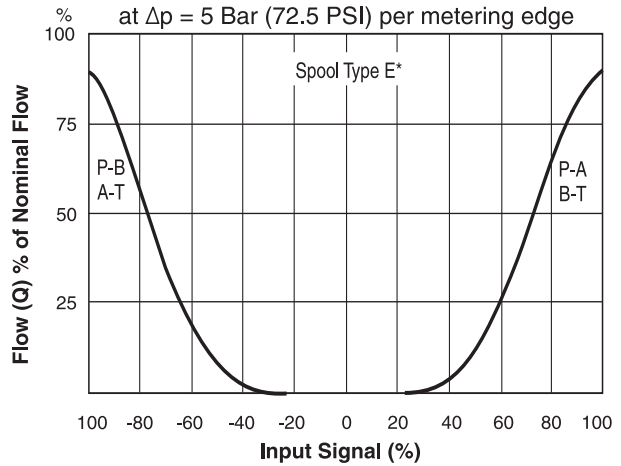
All performance curves measured with HLP46 at 50°C (122°F).

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D1FB*3*EE

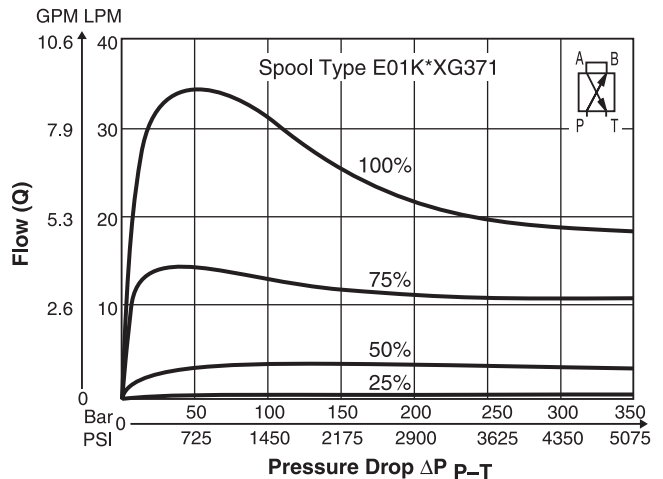
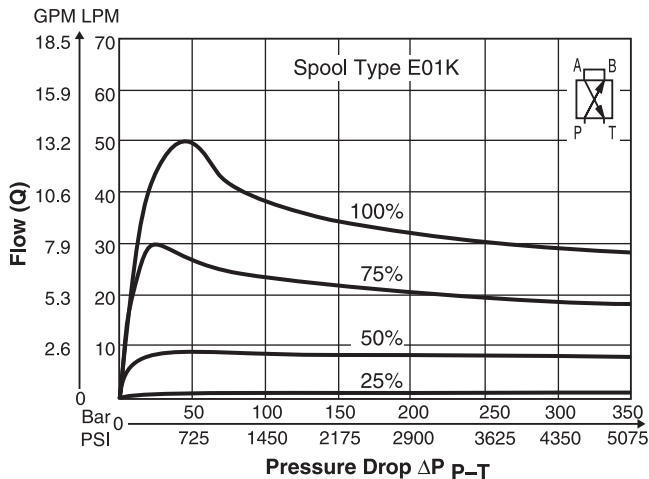


D1FB*3*EEXG371



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.

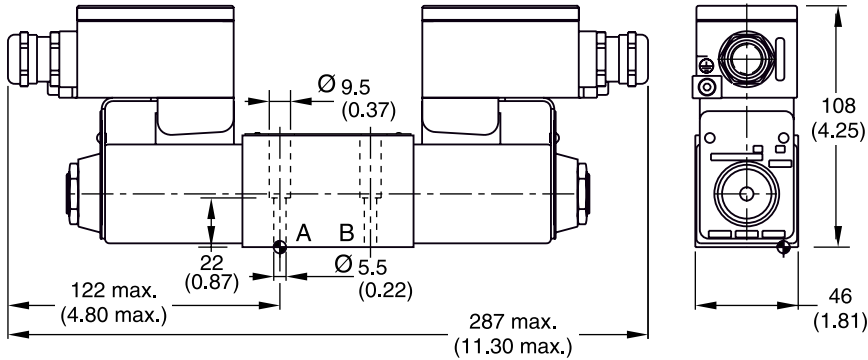


All performance curves measured with HLP46 at 50°C (122°F).

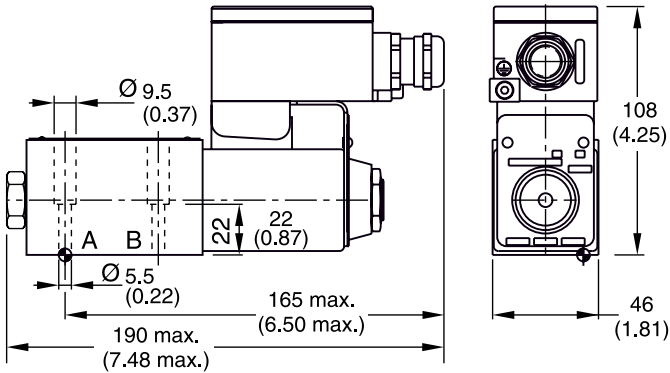
Inch equivalents for millimeter dimensions are shown in (**)

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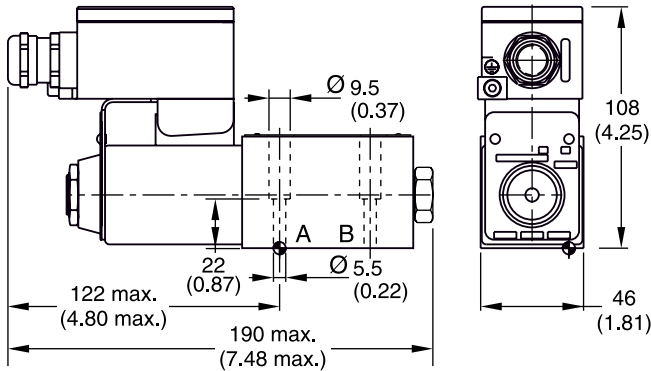
D1FB*C*EE



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

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