

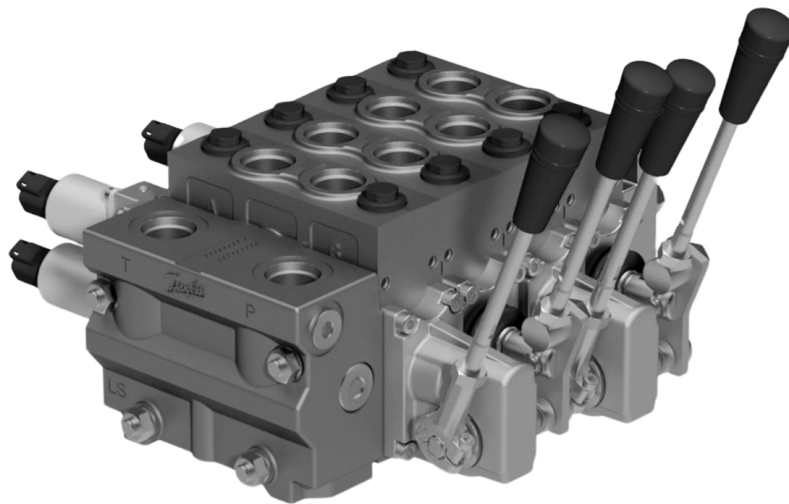
ENGINEERING
TOMORROW



Technical Information

Directional Control Valve

ECO 80 7mm



Revision history

Table of revisions

Date	Changed	Rev
August 2022	First edition	0101

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ECO 80 7mm dimensions

General information

General description

The ECO 80 LS is a hydraulic load sensing proportional valve group designed to give maximum flexibility in design and build concept. The ECO 80 LS is designed as a load sensing directional control valve which will lead to increased machine performance, higher efficiency, reduced cooling requirements and fuel saving compared to conventional directional control valves.

ECO 80 LS features

PVG load-sensing proportional valves features and benefits summarized in bullets below:

- Load sensing directional control:
 - Proportional control of oil flow to a work function
- Modular build concept:
 - Up to 12 basic modules per ECO 80 LS valve group
 - Different, interchangeable spool variants
 - System pressure up to 280 bar
 - Work port pressure up to 320 bar
 - Compact design and installation

ECO modules

EVP, pump side modules

- Built-in pressure relief valve
- Pressure gauge connection
- Versions:
 - Open center version for systems with fixed displacement pumps
 - Closed center version for systems with variable displacement pumps
 - Integrated 25 bar pilot oil supply for hydraulic and electrohydraulic actuation
 - Versions prepared for electrical LS unloading valve

EVB, basic modules

- Interchangeable spools
- Load holding check valve in channel P
- Option for shock and suction valves for port A and B

Actuation modules

The basic module could be fitted with three main different actuation modules:

- Mechanical
- Electrical
- Hydraulic
- Pneumatic

General information

Safety in systems

All makes and all types of control valves (incl. proportional valves) can fail, thus the necessary protection against the serious consequences of function failure should always be built into the system. For each application an assessment should be made for the consequences of pressure failure and uncontrolled or blocked movements.

Warning

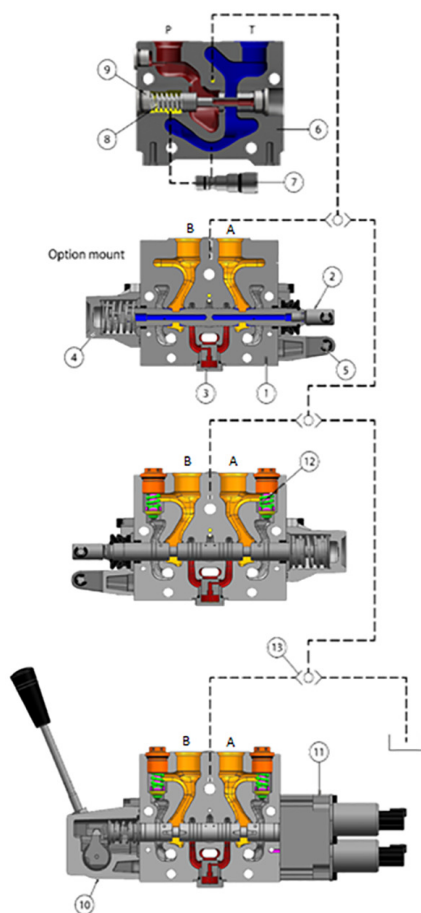
All makes/brands and types of directional control valves – inclusive proportional valves – can fail and cause serious damage. It is therefore important to analyze all aspects of the application.

Because the proportional valves are used in many different operation conditions and applications, the manufacturer of the application is alone responsible for making the final selection of the products – and assuring that all performance, safety and warning requirements of the application are met.

The process of choosing the control system – and safety levels – is governed by the machine directives EN 13849 (Safety related requirements for control systems).

General information

ECO 80 LS sectional view



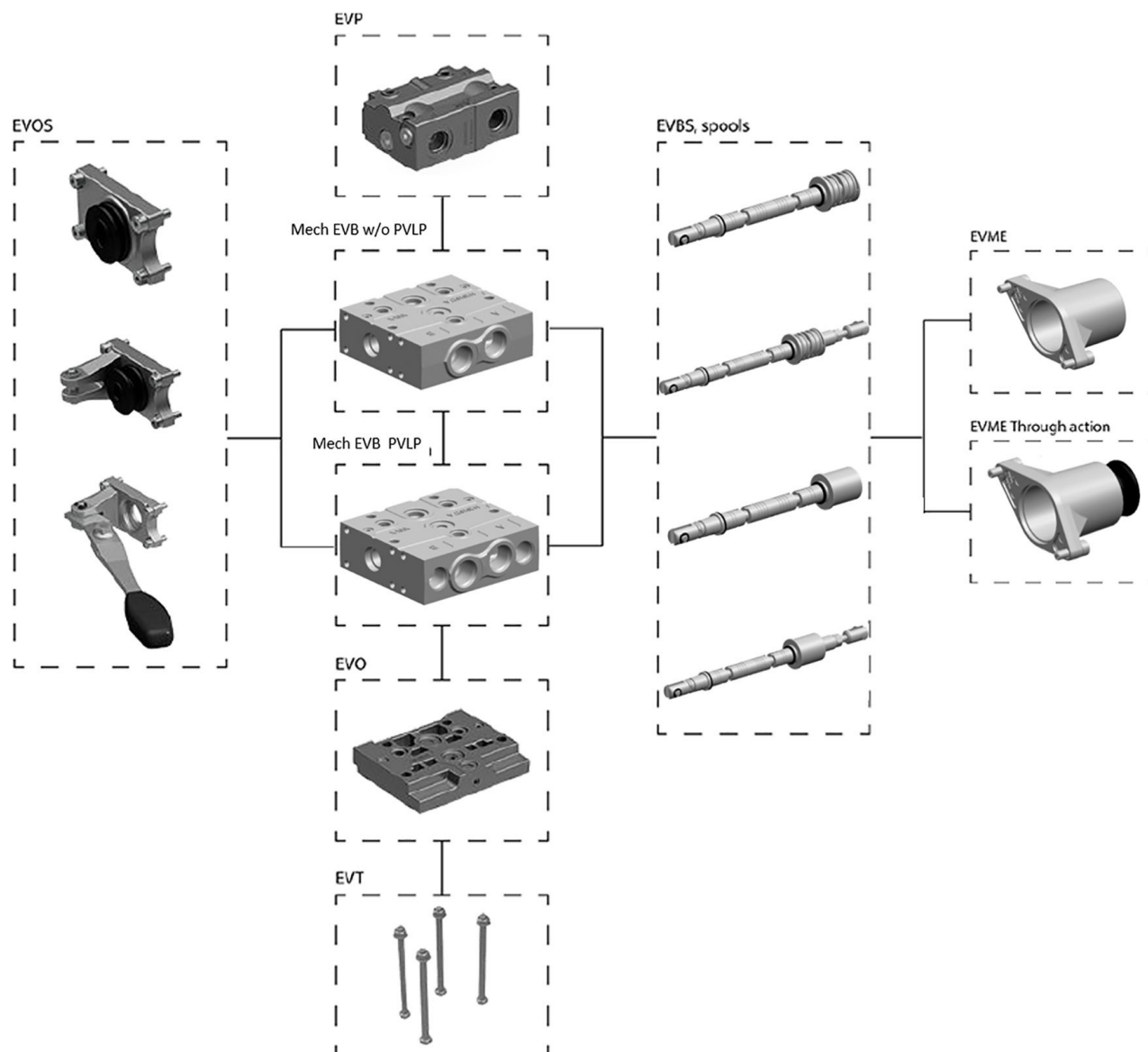
- 1** Work Section (EVB)
- 2** Spool (EVBS)
- 3** Check valve
- 4** Open spool centering (EVME)
- 5** Mechanical actuator (EVOS)
- 6** Inlet module (EVP)
- 7** Load sense relief valve
- 8** Unloader spool
- 9** Unloader spool spring
- 10** Mechanical actuator (EVM)
- 11** Electrical actuator (EVHC)
- 12** Shock valve (PVLP)
- 13** Shuttle disc

Option mount only possible with EVOS/EVME configuration

Mechanical acting ECO 80 modules

This section will only be about the mechanical acting modules of the ECO 80 portfolio. For information on the electrical actuated modules of the ECO80 portfolio, see [Electrical acting ECO 80 modules](#) on page 33.

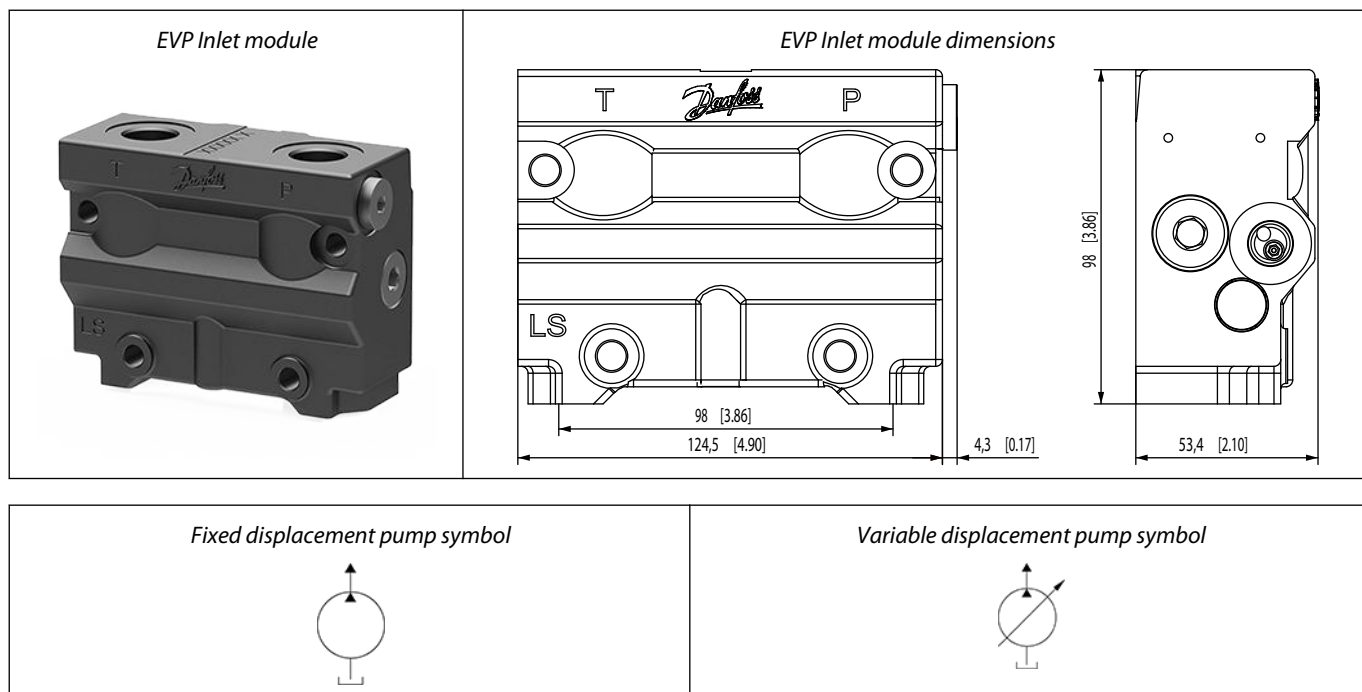
ECO 80 mechanical modules overview



Mechanical acting ECO 80 modules

EVP inlet modules - mechanical acting

The ECO 80 EVP inlet modules, also referred to as pump side modules, act as an interface between the ECO 80 directional valve group and the hydraulic pump and tank reservoir.



The EVP inlet module variants are based on a generic platform with a selection of additional features, enabling you to tailor the EVP to suit the demands of any hydraulic system:

- Open center EVP (for fixed displacement pumps)
- Closed center EVP (for variable displacement pumps)

Mechanical acting ECO 80 modules

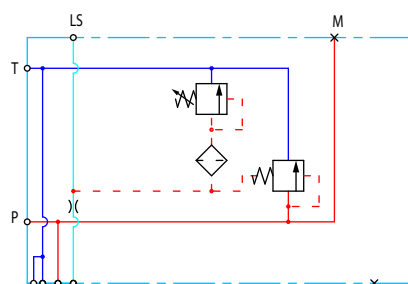
Open center EVP

The basic Open Center EVP inlet module is intended for use with fixed displacement pumps in applications, where a valve group with mechanically controlled work sections is desired.

The Open Center EVP features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge

Open center EVP schematic



Technical specification for EVP

Max. P-port continuous	Max. T-port static/dynamic	Max. rated flow
280 bar [4061 psi]	25/40 bar [365/580 psi]	100 l/min [26.4 US gal/min]

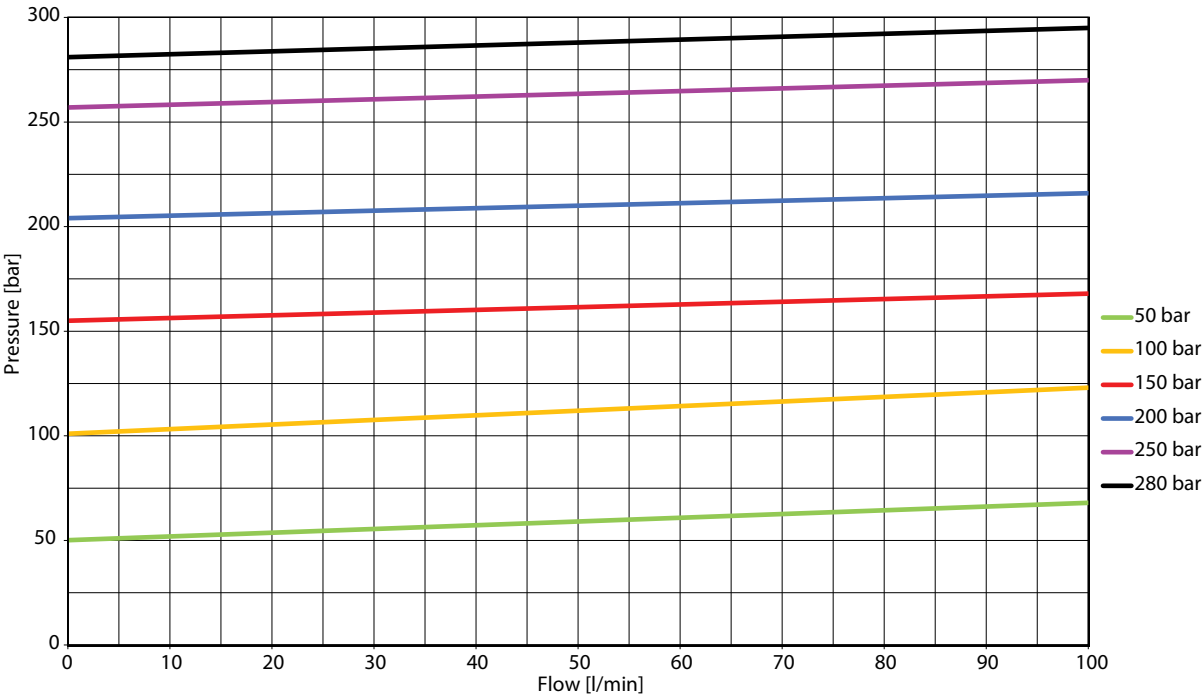
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

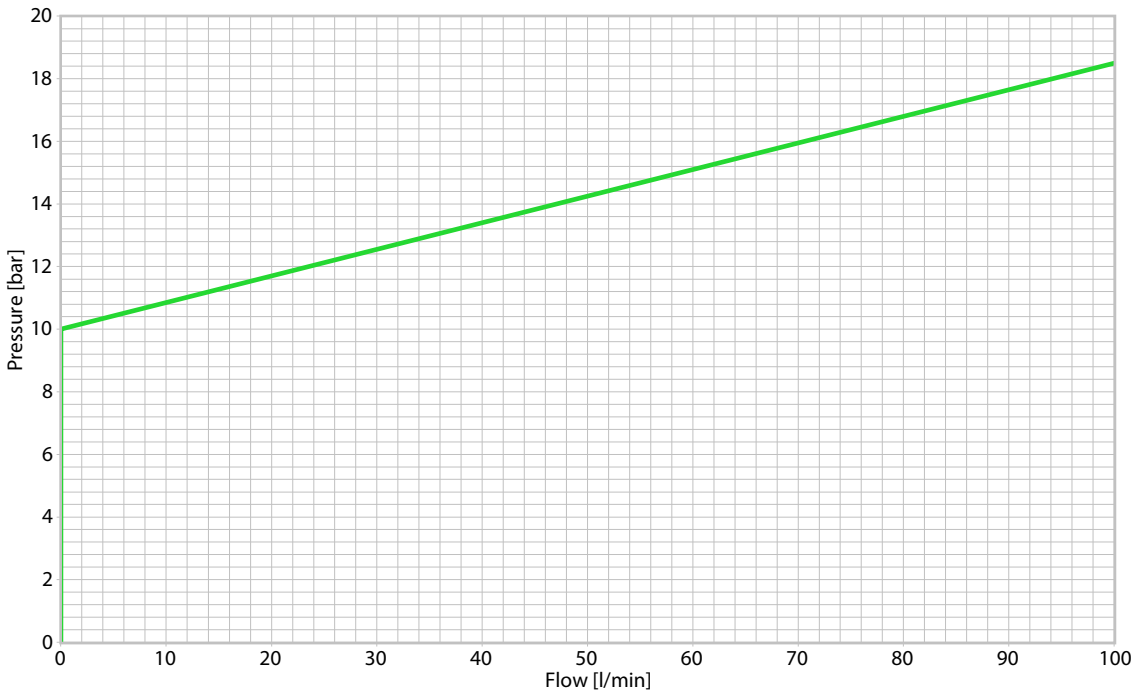
Mechanical acting ECO 80 modules

Theoretical performance graphs

Pressure relief valve characteristics



Neutral by-pass pressure drop characteristics (open center)



Mechanical acting ECO 80 modules*Part numbers for Open Center EVP*

Part numbers	P-port	T-port	M-, LS-port	Mounting
11173005	G 1/2	G 1/2	G 1/4	M8 x 1.25
11172981	7/8-14 UNF	7/8-14 UNF	9/16-18 UNF	M8 x 1.25

Mechanical acting ECO 80 modules

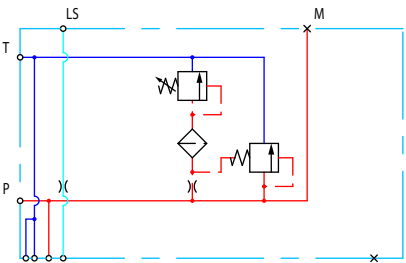
Closed center EVP

The basic Closed Center EVP inlet is intended for use with variable displacement pumps in applications where a valve group with mechanically controlled work sections is desired.

The Closed Center EVP features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge

Closed center EVP schematic



Technical specification for EVP

Max. P-port continuous	Max. T-port static/dynamic	Max. rated flow
280 bar [4061 psi]	25/40 bar [365/580 psi]	100 l/min [26.4 US gal/min]

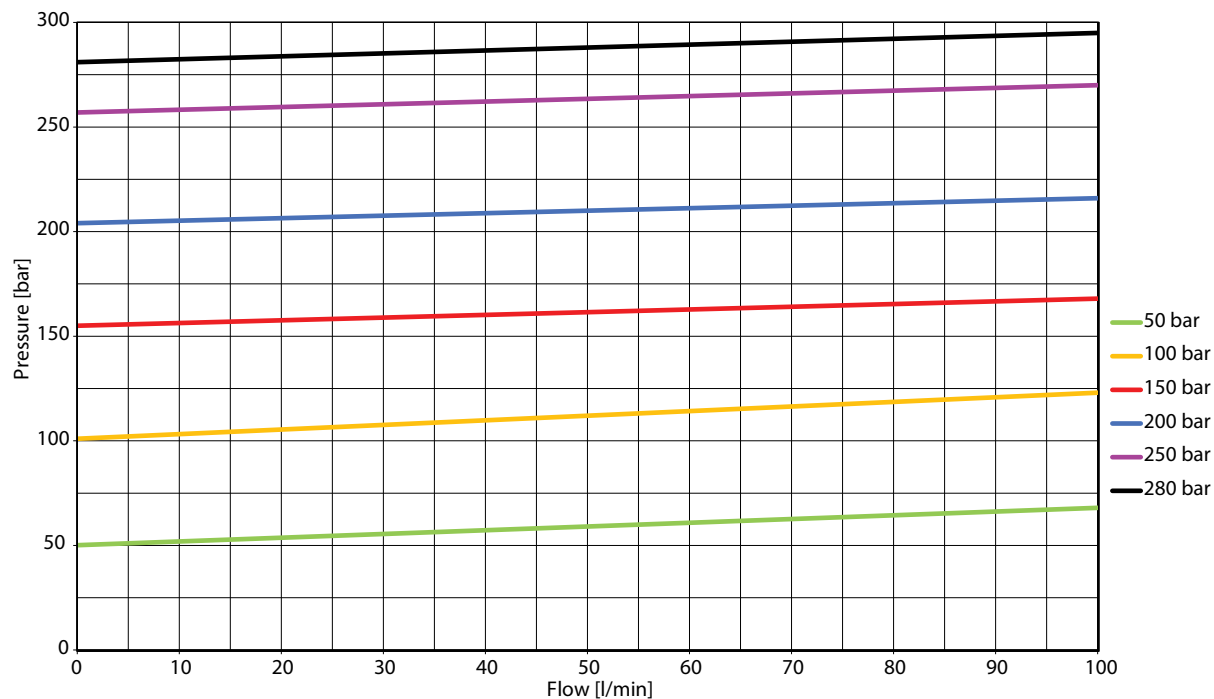
Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Mechanical acting ECO 80 modules

Theoretical performance graphs

Pressure relief valve characteristics



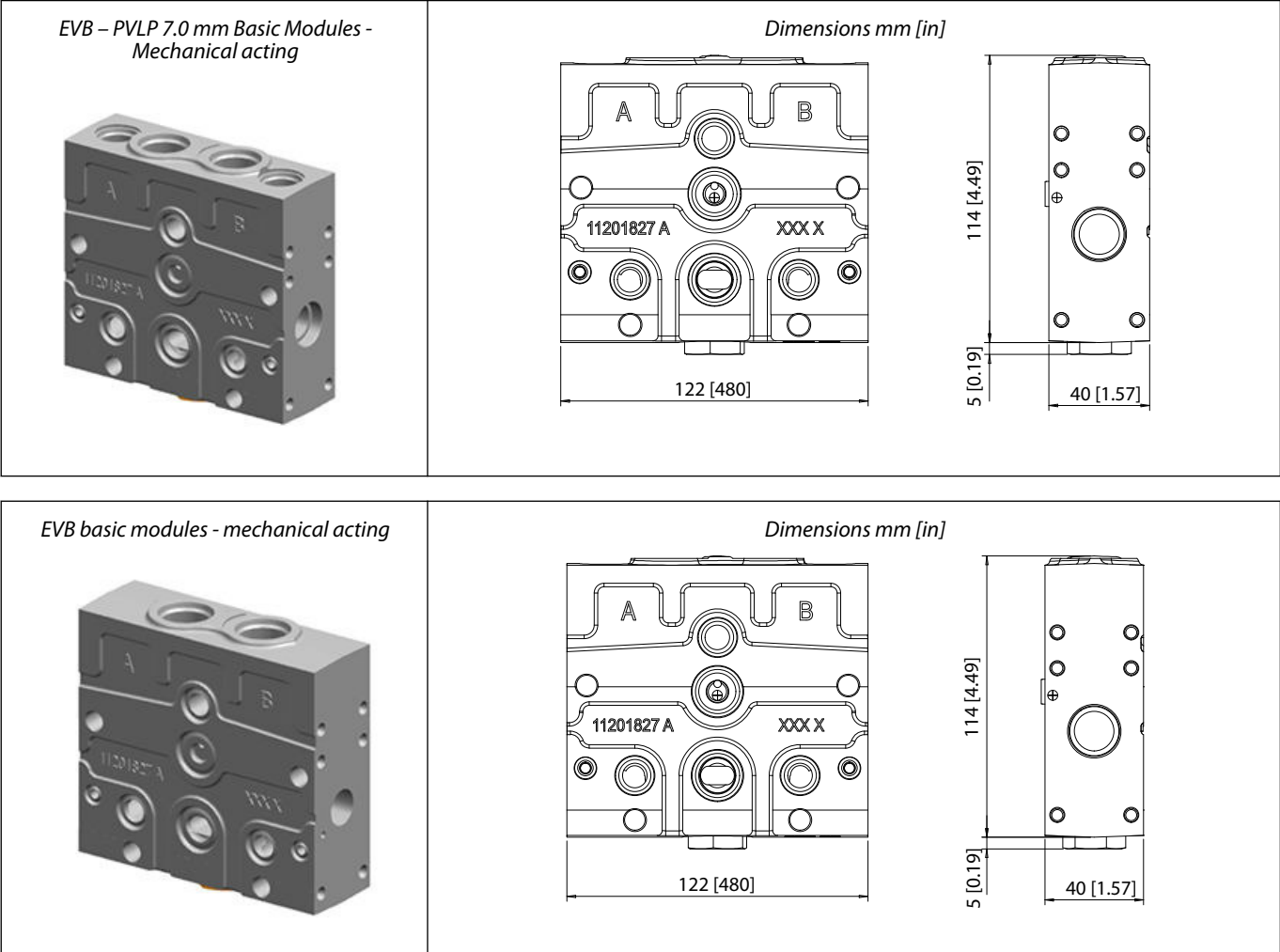
Part numbers for Mechanical Acting Closed Center EVP

Part numbers	P-port	T-port	M-, LS-port	Mounting
11173006	G 1/2	G 1/2	G 1/4	M8 x 1.25
11173002	7/8-14 UNF	7/8-14 UNF	9/16-18 UNF	M8 x 1.25

Mechanical acting ECO 80 modules

EVB basic modules - mechanical acting

The ECO 80 EVB basic modules, also referred to as work sections, are the interface between the ECO 80 directional control valve and the work function such as a cylinder or a motor. The EVB comes in two main variants – a low body and a medium body with shock/anti-cavitation valve facility (PVLP)



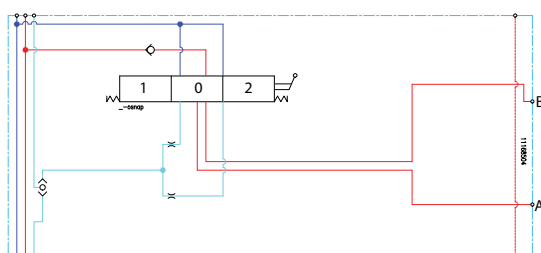
Mechanical acting ECO 80 modules

EVB body design and technical data

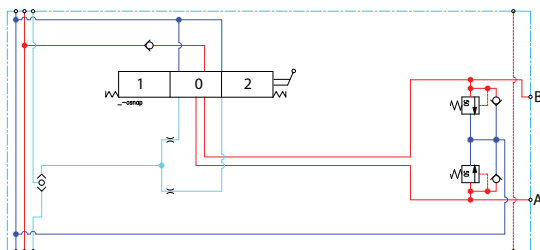
Features

- Integrated LS shuttle network
- Load drop check valve
- Shock/anti-cavitation valve and suction facility (PVLP/PVLA)

EVB without PVLP schematic



EVB with PVLP schematic



EVB mechanical acting technical data

Technical specifications for A/B port

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
280 bar [4061 psi]	320 bar [4641 psi]	100 l/min [26.4 US gal/min]

Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for EVB basic modules – mechanical acting

Part numbers	A/B – thread port	Facilities for shock valves A/B
11225782	7/8-14 UNF	No
11225784	7/8-14 UNF	Yes
11225783	G 1/2	No
11225785	G 1/2	Yes

Mechanical acting ECO 80 modules**EVb basic modules accessories**

The generic EVb module accessory platform include the PVLP shock and anti-cavitation valve and PVLA suction valve.

- PVLP Shock and Anti-cavitation valve
- PVLA Suction valve
- Cavity plug

Mechanical acting ECO 80 modules

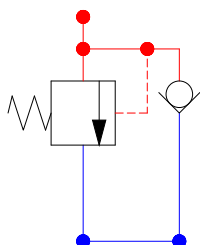
PVLP shock/anti-cavitation valve

The PVLP will relieve a pressure peak to the internal tank galleries and will furthermore suck oil from the tank to the work port to prevent cavitation. Pressure settings range 32-320 bar [460-4641 psi].

Features:

- Shock valve
- Anti-cavitation
- Lifetime of 200,000 actuations
- Optional fixed or adjustable

PVLP schematic



Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for fixed PVLP

Part number	Pressure setting in bar [psi]
157B2032	32 [460]
157B2050	50 [725]
157B2063	63 [914]
157B2080	80 [1160]
157B2100	100 [1450]
157B2125	125 [1813]
157B2140	140 [2031]
157B2150	150 [2175]
157B2160	160 [2320]
157B2175	175 [2538]
157B2190	190 [2755]
157B2210	210 [3045]
157B2230	230 [3335]
157B2240	240 [3480]
157B2250	250 [3625]
157B2265	265 [3845]
157B2280	280 [4061]
157B2300	300 [4351]
157B2320	320 [4641]

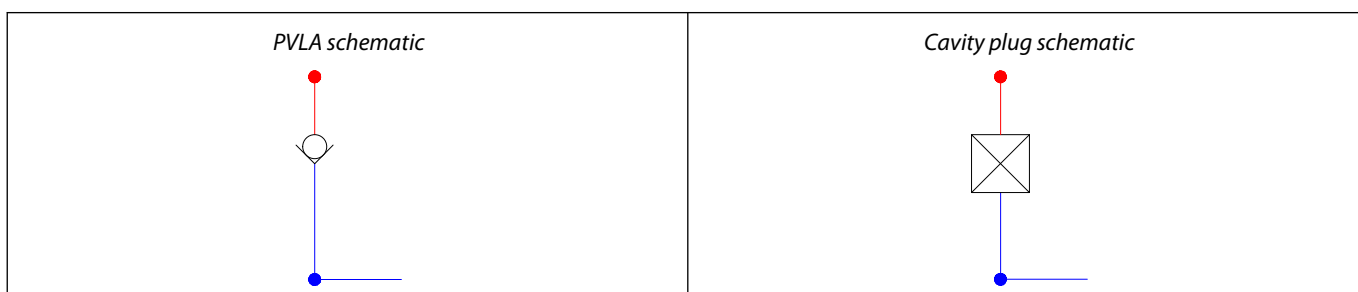
Mechanical acting ECO 80 modules

Part numbers for adjustable PVLP

Part number	Pressure setting in bar [psi]
11006594	121-250 [1755-3626]
11006595	251-285 [3640-4134]

PVLA suction valve and cavity plug

The PVLA will suck oil from the tank to the work port to prevent cavitation by the 0.5 bar spring. The plug will ensure that when using a single acting spool, all flow returning through the work port is led to tank.



Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for PVLA and plug

PVLA	Cavity plug
157B2001	11177714

Mechanical spools

EVBS mechanical flow control spools

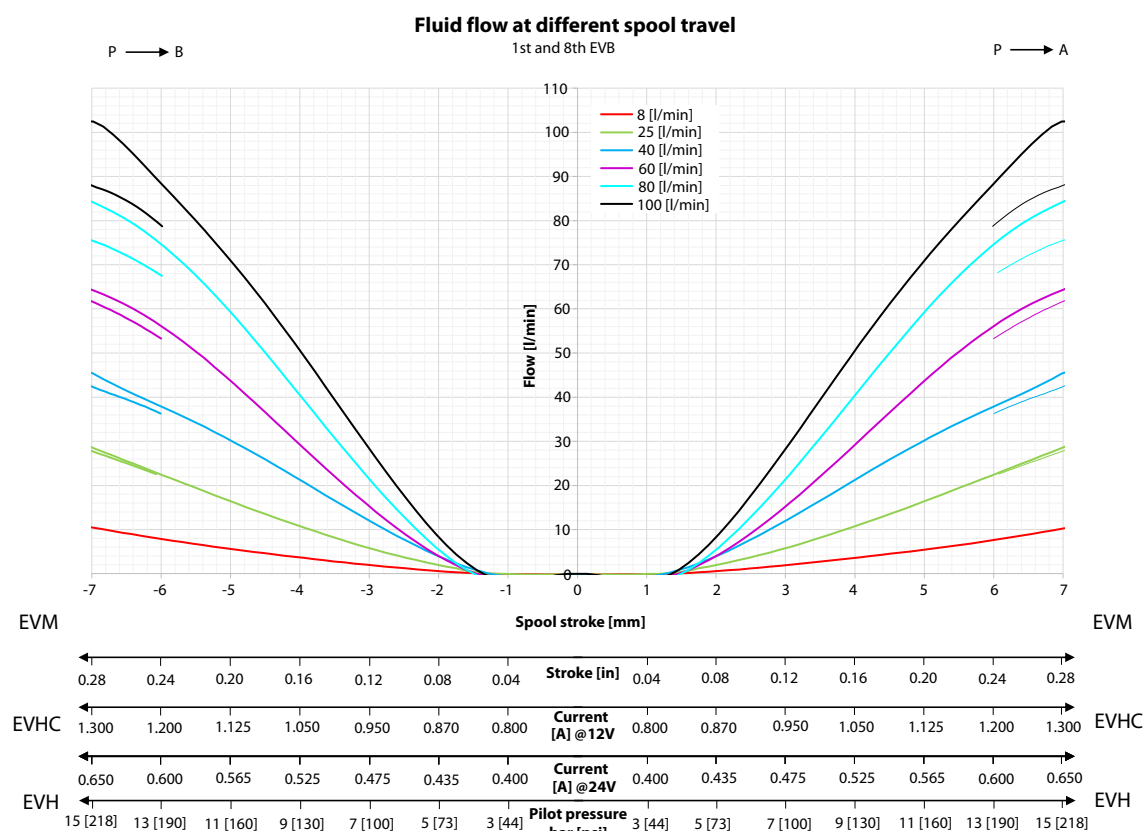
The mechanical acting EVBS spools determine the flow out of the work section and are based on a generic platform with a wide selection of additional features, enabling you to tailor the EVBS to suit the demands of any hydraulic system and any function.

The mechanical acting EVBS spool comes in four different main variants:

- EVBS Female Extension
- EVBS Female Extension and through acting
- EVBS Female Extension and Detent 03 position and 02 position spool out or in
- EVBS Female Extension and Detent 03 position and 02 position spool out or in with through acting
- EVBS Female Extension and Float spools/spring center and Detent in fourth position

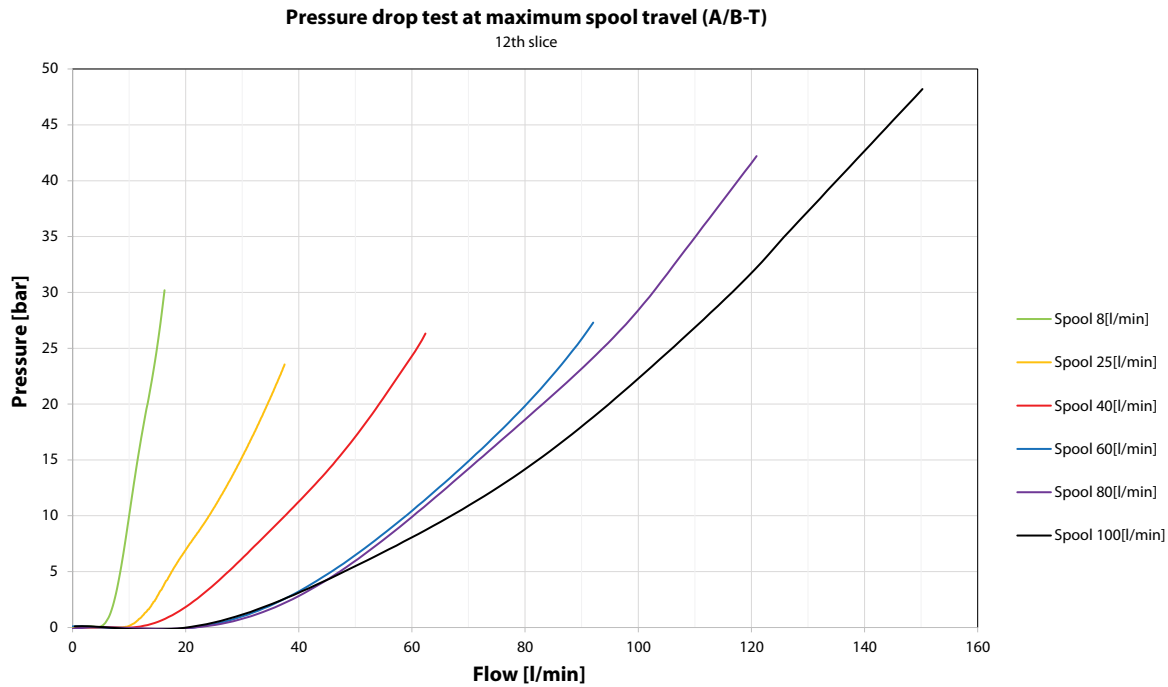
EVBS fluid flow characteristics - Theoretical performance

Oil flow as a function of spool travel @ 15 bar margin




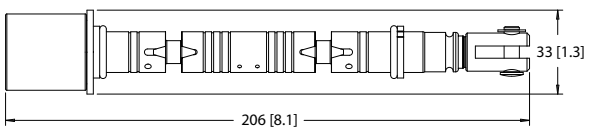
Mechanical spools

Pressure drop at maximum spool travel (A/B-T)

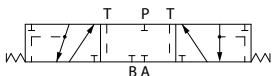
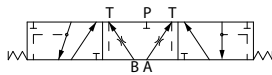
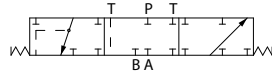


Mechanical spools


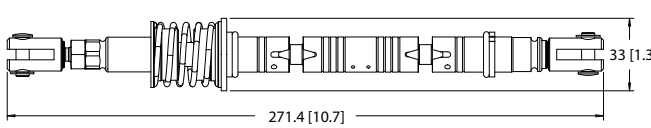
EVBS female extension

<p><i>EVBS Female Extension</i></p> 	<p><i>Dimensions mm [in]</i></p> 
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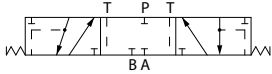
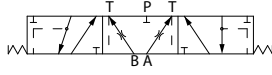

Part numbers for EVBS Female Extension

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11225735	11225738	11225741	11225744	11225747	11225750
4-way, 3-position Throttled open neutral position		11225734	11225737	11225740	11225743	11225746	11225749
3-way, 3-position Closed neutral position		11225736	11225739	11225742	11225745	11225748	11225751

EVBS female extension and through acting


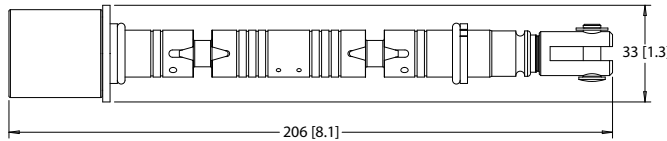
<p><i>EVBS Female Extension and through acting</i></p> 	<p><i>Dimensions mm [in]</i></p> 
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Part numbers for EVBS Female Extension

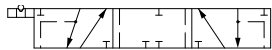

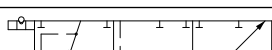
Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11226151	11226154	11226158	11226161	11226164	11226167
4-way, 3-position Throttled open neutral position		11226150	11226153	11226157	11226160	11226163	11226166
3-way, 3-position Closed neutral position		11226152	11226155	11226159	11226162	11226165	11226168

Mechanical spools


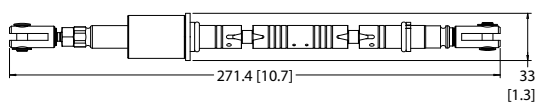
EVBS female extension and Detent 03 and 02 position spool out or in

<p>EVBS female extension and detent 03 position</p> 	<p>Dimensions mm [in]</p> 
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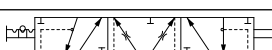
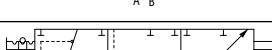
Part numbers for EVBS female extension and Detent 03 position

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11226070	11226073	11226076	11226079	11226082	11226085
4-way, 3-position Throttled open neutral position		11226069	11226072	11226075	11226078	11226081	11226084
3-way, 3-position Closed neutral position		11226071	11226074	11226077	11226080	11226083	11226086

EVBS female extension and through acting/Detent 03 position

<p>Spool</p> 	<p>Dimensions mm [in]</p> 
--	--

Part numbers

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11226301	11226304	11226307	11226310	11226313	11226316
4-way, 3-position Throttled open neutral position		11226300	11226303	11226306	11226309	11226312	11226315
3-way, 3-position Closed neutral position		11226302	11226305	11226308	11226311	11226314	11226317

Mechanical spools

EVBS female extension and float spool and Detent 04 position

Spool

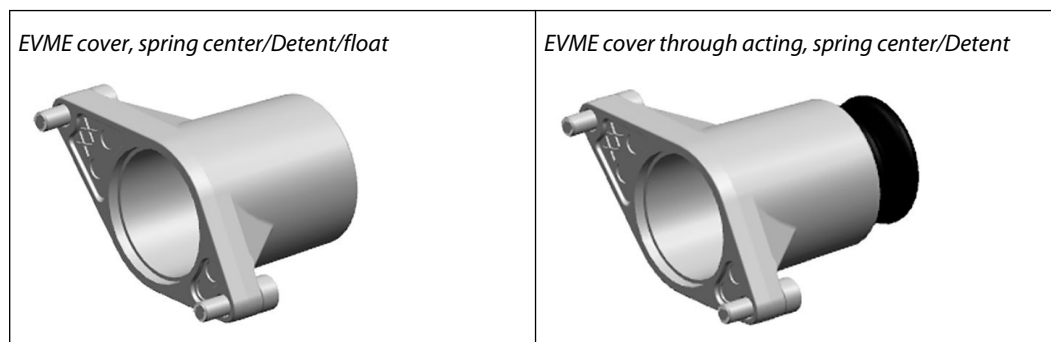
Dimensions mm [in]

Part numbers

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 4-position Float, P ▸ A ▸ F		11226834	11226835	11226837	11226838	11226839	11226840
4-way, 4-position Float, P ▸ B ▸ F		11227054	11227055	11227056	11227057	11227058	11227059

Mechanical spools

EVME mechanical spools cover



Part numbers

Part numbers	Description
11225944	EVME, Spring Center/Detent/Float
11173406	Accessory Detent 02 Position
11225946	EVME, through acting, Spring Center/Detent

ECO 80 7mm EVME, detent 03 position

The EVME detent 03 positions consists of an aluminum cover mounted on the end of the valve slice which keep the position of the spool in neutral positions and spool in/out.

The EVME detent 03 positions should be used with spool option: Mechanical flow control spools, Female Extension and Detent 03 position. And can be combined with any EVOS, Open spool actuators.

ECO 80 7mm EVME, detent 02 position spool to A or B

The EVME detent 02 positions consists of an aluminum cover mounted on the end of the valve slice which keep the position of the spool in neutral positions and spool out, position spool in is blocked.

The EVME detent 02 positions should be used with spool option: Mechanical flow control spools, Female Extension and Detent 03 position with accessory part number 11173406. And can be combined with any EVOS, Open spool actuators.

ECO 80 7mm EVME, through action

The EVME through action consists of an aluminum cover with a rubber boot to protect the spool, mounted on the end of the valve slice which ensures the position of the spool in neutral positions and spool in/out.

The valve is actuated by directly pulling or pushing the main spool inside the valve hence controlling the flow. Actuating the spool fully will move all 5 mm and give full flow. The EVME through action should be used with spool option: Mechanical flow control spools, Female Extension and through acting. Can be combined with any EVOS, Open spool actuators.

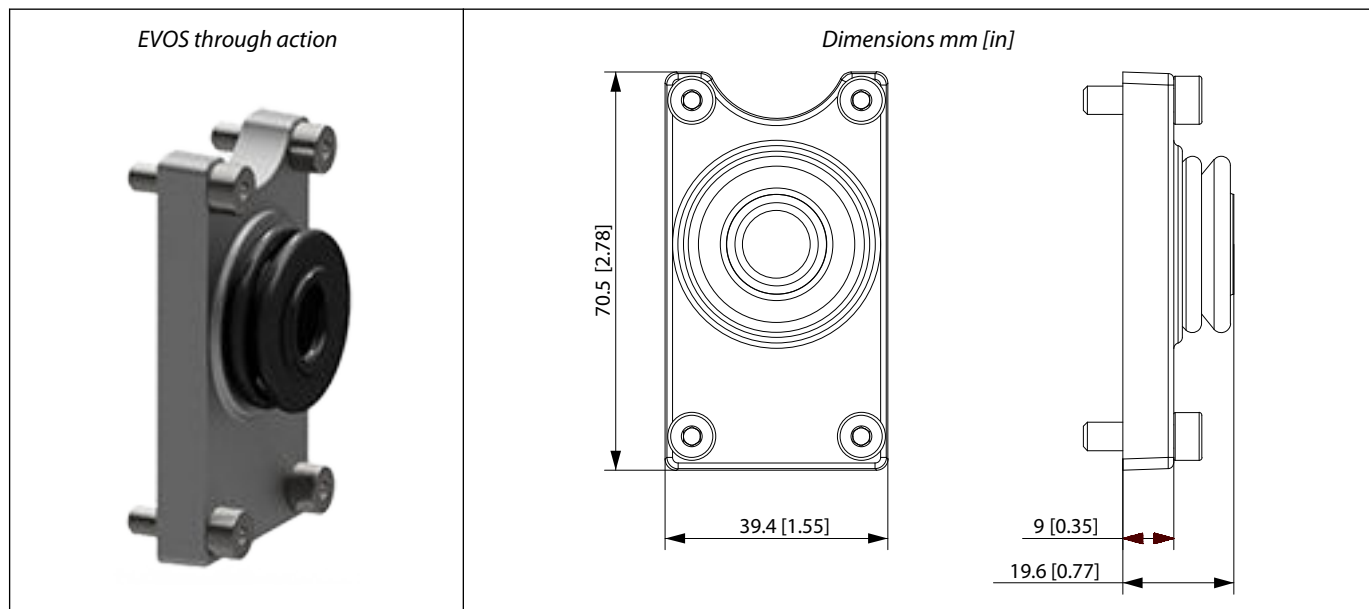
Mechanical spools

EVOS open spools

EVOS open spool through action

The EVOS open spool through action consists of an aluminum base with a rubber boot to protect the spool, mounted on the end of the valve slice, the connection with application is a female extension assembled on the main spool.

The valve is actuated by directly pulling or pushing the main spool inside the valve hence controlling the flow. Actuating the spool fully will move all 5 mm and give full flow. The EVOS should be used with open spool mechanical actuation and can be combined with any EVME, spring center, Detent, through action and micro switch.

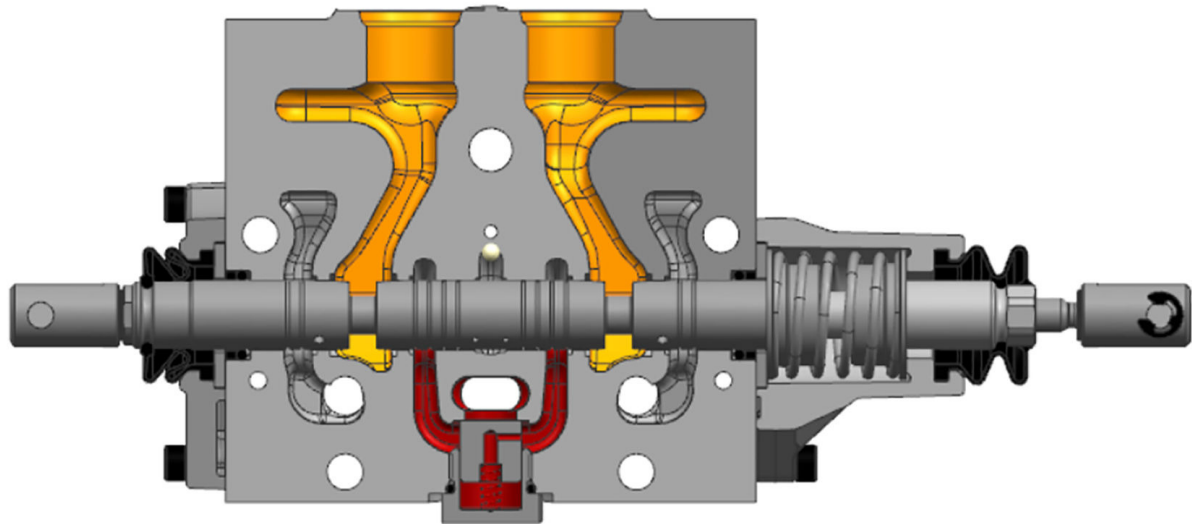


Operating force for EVOS through action

Spool displacement	Operating linear force
	EVOS + EVME (Through Acting)
From neutral position	135 ± 5 [N]
Maximum spool travel	180 ± 5 [N]

Mechanical spools

EVOS through action function



Part numbers

Description	Part number
EVOS80LS Through action	11172533

Mechanical spools

EVOS open spool mechanical actuation

The EVOS mechanical actuation consists of an aluminum base with a lever and a rubber boot to protect the spool, mounted on the end of the valve slice. When actuating the lever, the operator is directly pulling or pushing on the main spool inside the valve hence controlling the flow.

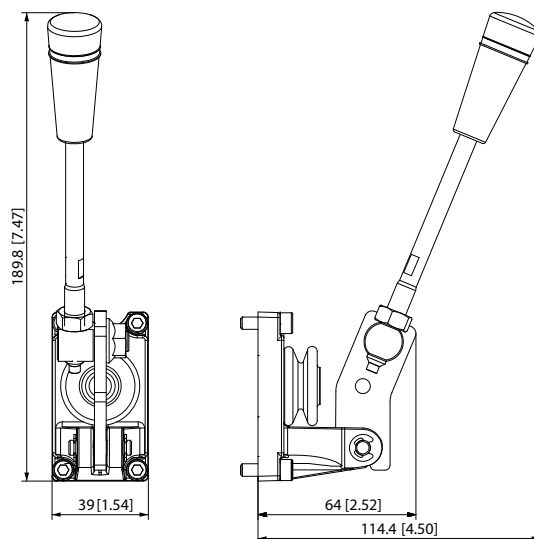
The lever has a travel of 14° in either direction from neutral. Actuating the lever fully will move the spool all 5 mm and give full flow. The lever can be mounted / removed without having to remove the EVOS base.

The EVOS should be used with open spool mechanical actuation and can be combined with any EVME, spring center, Detent, through action and micro switch.

EVOS mechanical actuation



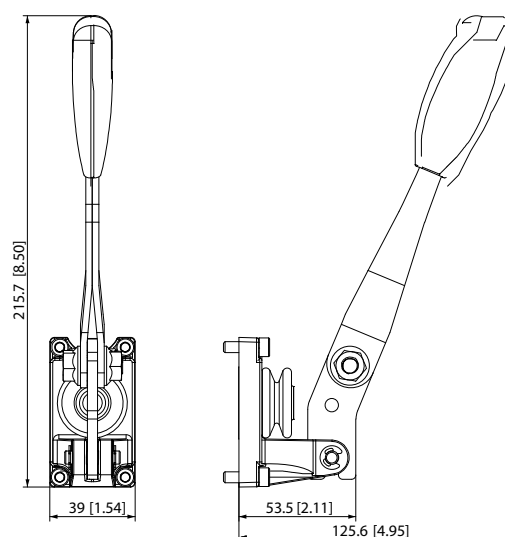
Dimensions mm [in]



EVOS mechanical actuation power lever



Dimensions mm [in]



Mechanical spools

Operating torque for EVOS mechanical actuation

Spool displacement	Operating torque N·m
	EVOS + EVME (spring center)
From neutral position	3.5 ± 0.2
Maximum spool travel	4.5 ± 0.2
No control level position	2 x 6
Control lever range	±14°

Part numbers

Description	Part number
EVOS80LS Mechanical Actuator	047768
EVOS80 Mechanical Actuator with lever	11175314
EVOS80 Mechanical Actuator with power lever	11227308
Accessories - Base handle black	11170923
Accessories - Base handle black power lever	11194826

End plate for mechanical modules

The ECO80 EVO end plates close off the valve stack section by placing them at the end. Furthermore, the end plate is ensuring Load Sense (LS) is relieved to tank pressure when the valve is not operated.

The EVO end plate variants are based on a generic platform with a selection of additional features, enabling you to tailor the EVO to suit the demands of any hydraulic system.

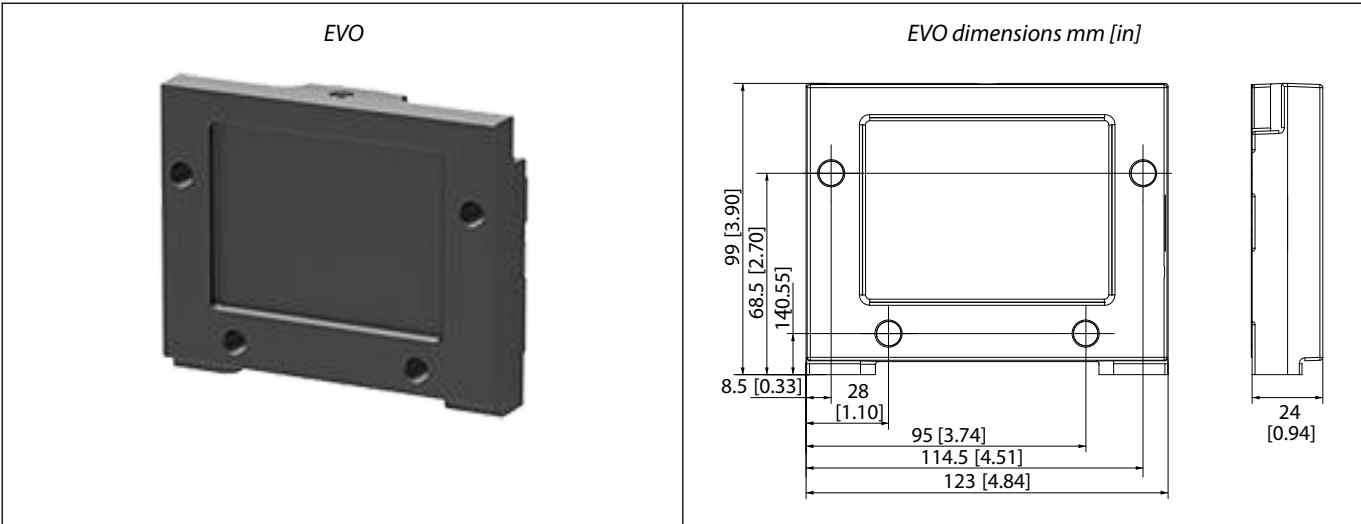
The generic EVO end plate platform for mechanical modules includes the following main variants:

- EVO
- EVO with LX-connection and pneumatic port

End plate for mechanical modules

EVO

The EVO end plate closes off the valve stack section by placing it at the end. Furthermore, the end plate is ensuring Load Sense (LS) is relieved to tank pressure when the valve is not operated



Schematic



Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

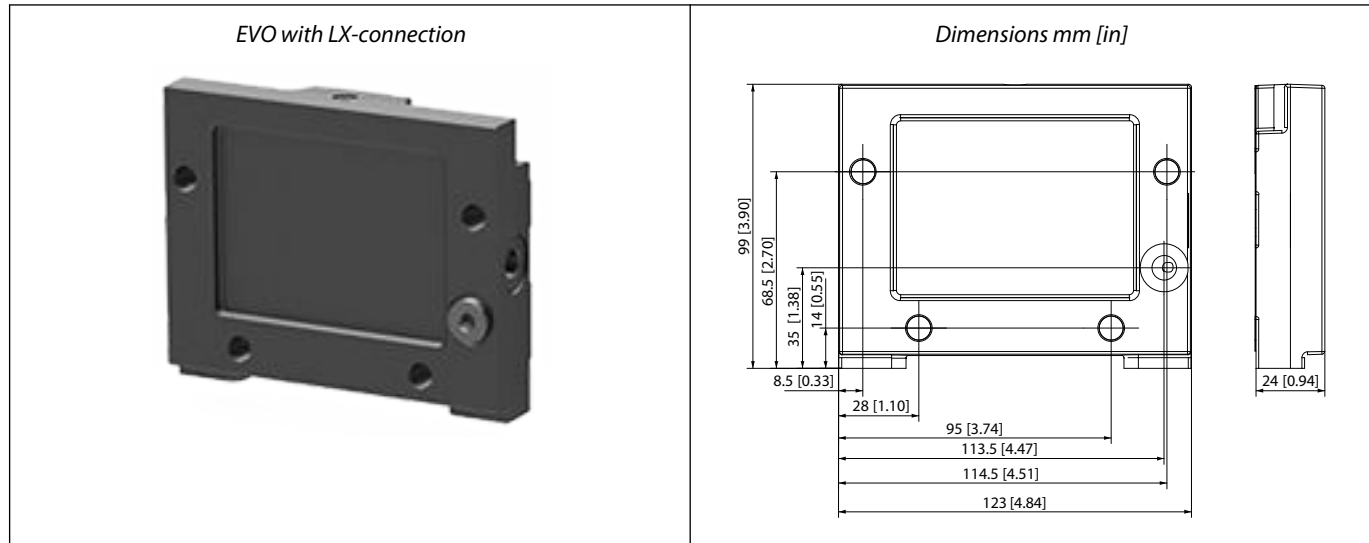
Part numbers for EVO end plate

Part number	Description	Mounting
11191585	EVO End plate	M8

End plate for mechanical modules

EVO with LX-connection

The EVO end plate closes off the valve stack section by placing it at the end. Furthermore, the end plate is ensuring Load Sense (LS) is relieved to tank pressure when the valve is not operated. The LX port enables other remote valves to be connected onto the Load Sense shuttle network. The end plate also features a blocked pneumatic port.



Schematic



Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers

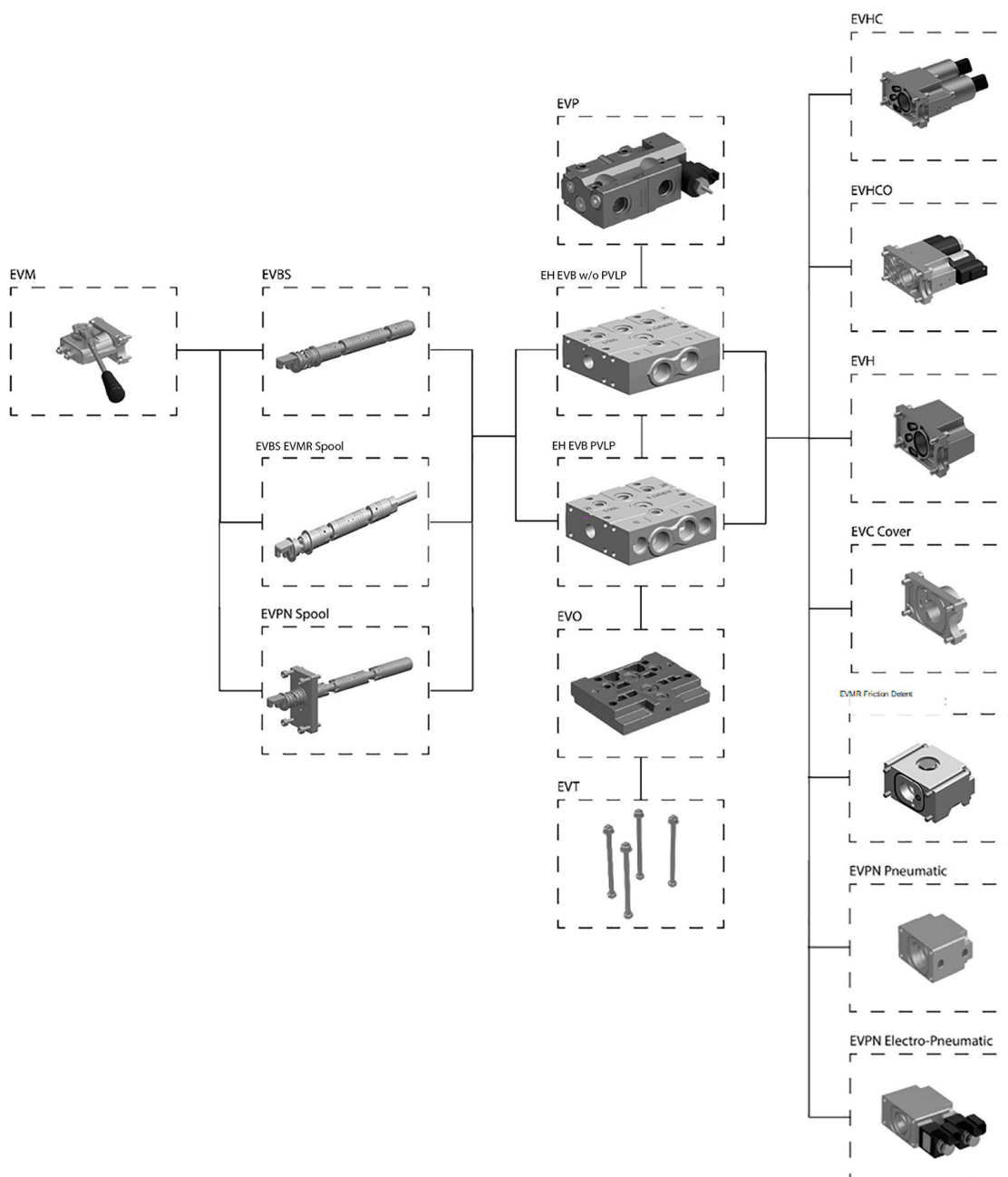
Part number	Description	LX port	Pneumatic port	Mounting
11191583	EVO End plate with LX connection	G1/8-28	G1/8-28	M8
11191582		7/16-20 UNF	G1/8-28	M8

Electrical acting ECO 80 modules

This section will only be about the electrical actuated modules of the ECO 80 portfolio.

ECO 80 electrical modules overview

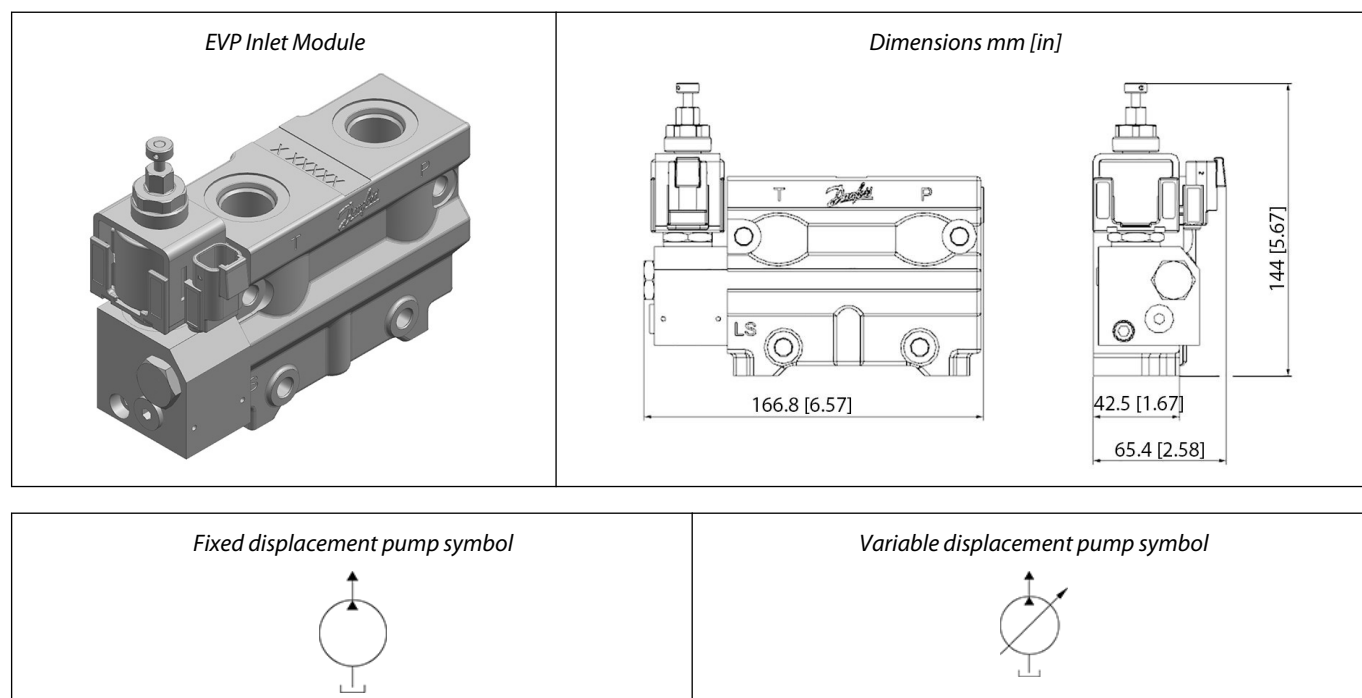
Electrical modules exploded view



Electrical acting ECO 80 modules

EVP inlet modules - electrical

The ECO 80 EVP inlet modules, also referred to as pump side modules, act as an interface between the ECO 80 directional valve group and the hydraulic pump and tank reservoir.



The EVP inlet module variants are based on a generic platform with a selection of additional features, enabling you to tailor the EVP to suit the demands of any hydraulic system:

- [Open center EVP with PPRV](#) on page 35 (for fixed displacement pumps)
- [Closed center EVP with PPRV](#) on page 38 (for variable displacement pumps)

Electrical acting ECO 80 modules

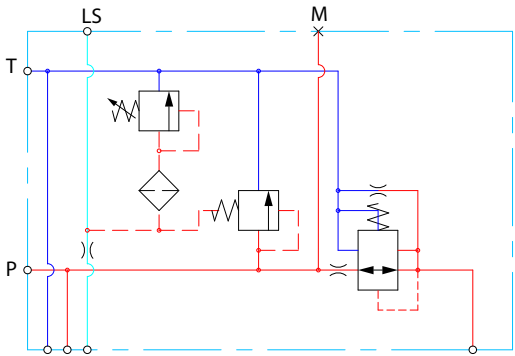
Open center EVP with PPRV

The Open Center EVP inlet with integrated pilot pressure reduction valve (PPRV) is intended for use with fixed displacement pumps in applications, where a valve group with electro-hydraulically or hydraulically controlled work sections are desired (EVH, EVHC or EVHCO).

The Open Center EVP with PPRV features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure Reducing valve (PPRV) for EVH, EVHC, or EVHCO
- Optional LS unloading valve, EVPX
- Optional plug for external pilot oil supply

Schematic



Technical specification for EVP with PPRV

Max. P-port continuous	Max. T-port static/dynamic	Max. rated flow
280 bar [4061 psi]	25/40 bar [365/580 psi]	100 l/min [26.4 US gal/min]

Operating parameters

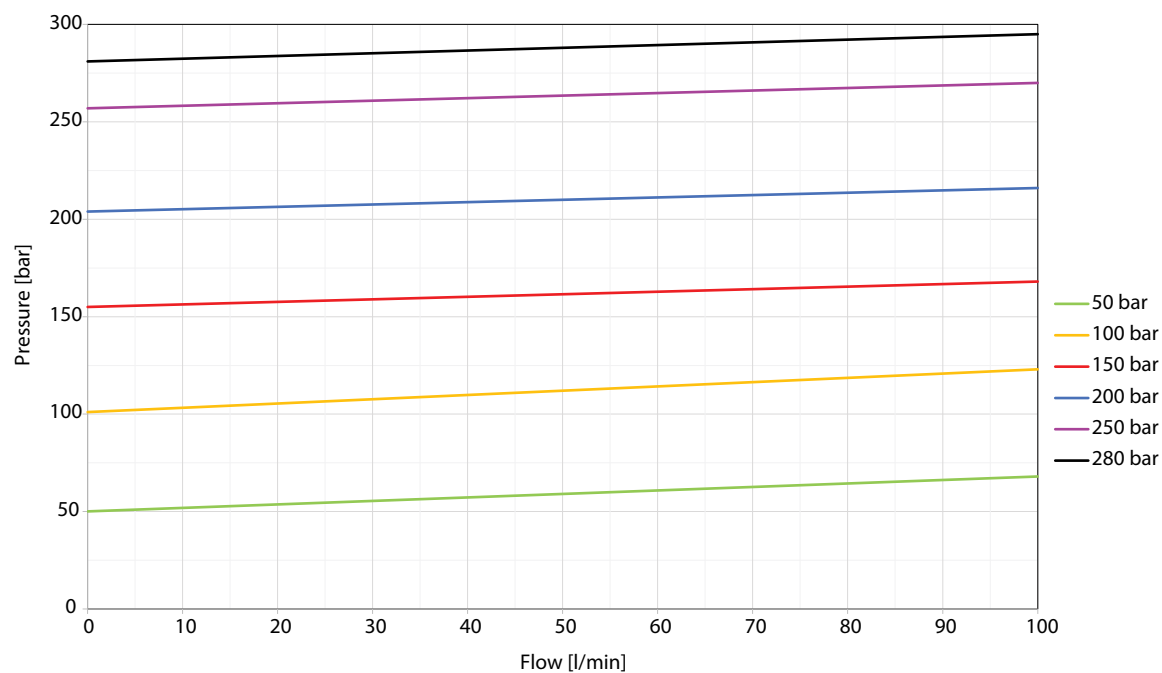
Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Electrical acting ECO 80 modules

Open Center EVP with PPRV theoretical performance graphs

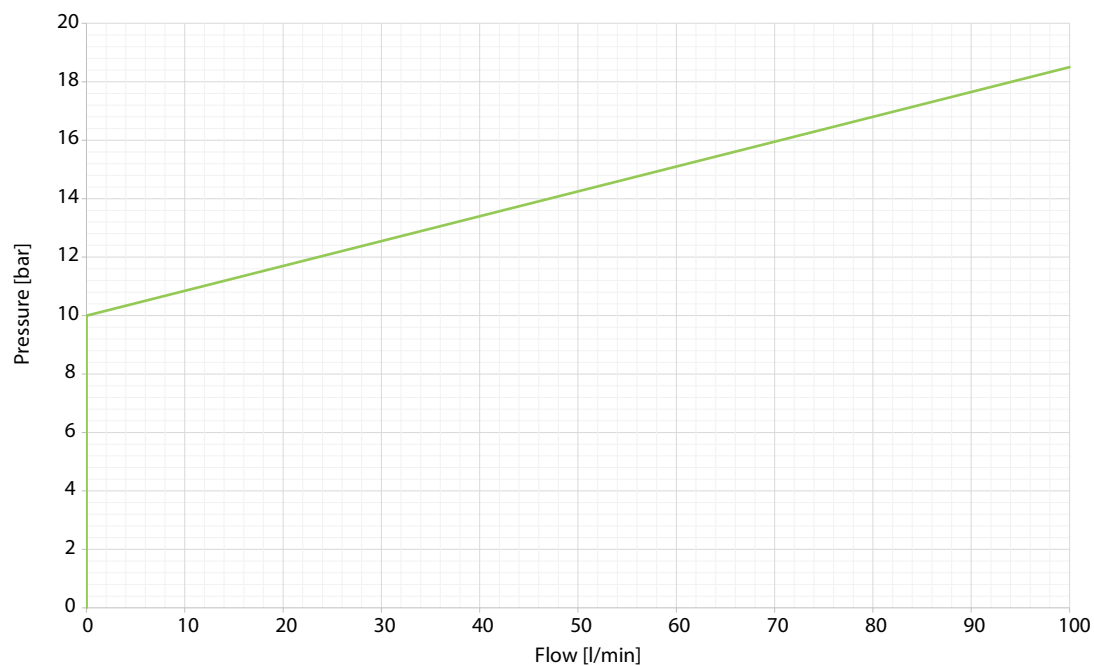
Pressure relief valve characteristics

Curves to inlet pressure x flow



Neutral by-pass pressure drop characteristics

Neutral flow pressure in EVP open center inlet



Electrical acting ECO 80 modules

Part numbers	P-port	T-port	M-, LS-port	Mounting	EVPX
11172996	G 1/2	G 1/2	G 1/4	M8 x 1.25	-
11173010	7/8-14 UNF	7/8-14 UNF	9/16-18 UNF	M8 x 1.25	-
11173023	G 1/2	G 1/2	G 1/4	M8 x 1.25	Yes
11173000	7/8-14 UNF	7/8-14 UNF	9/16-18 UNF	M8 x 1.25	Yes

Electrical acting ECO 80 modules

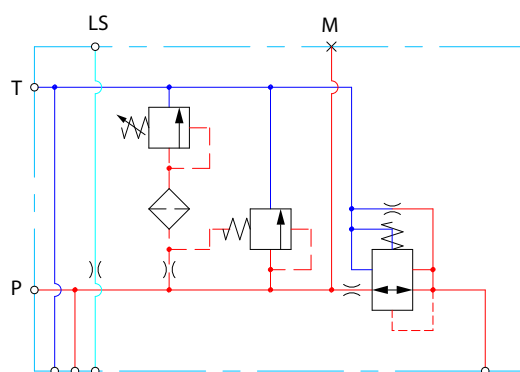
Closed center EVP with PPRV

The Closed Center EVP inlet with integrated pilot pressure reduction valve (PPRV) is intended for use with variable displacement pumps in applications, where a valve group with electro-hydraulically or hydraulically controlled work sections is desired (EVH, EVHC or EVHCO).

The Closed Center EVP with PPRV features:

- Integrated LS pressure relief valve
- Threaded ports for P/T/LS and M measuring gauge
- Integrated pilot pressure reducing valve (PPRV) for EVH, EVHC, or EVHCO
- Optional plug for external pilot oil supply

Closed center EVP with PPRV schematic



Technical specification for EVP with PPRV

Max. P-port continuous	Max. T-port static/dynamic	Max. rated flow
280 bar [4061 psi]	25/40 bar [365/580 psi]	100 l/min [26.4 US gal/min]

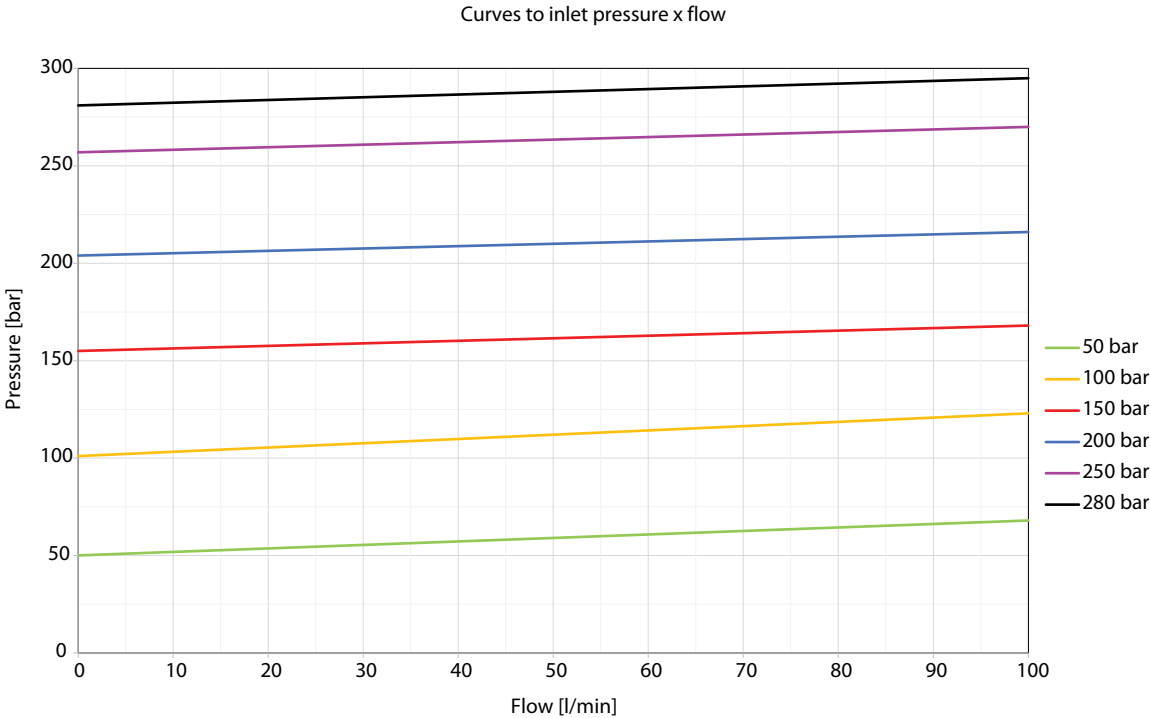
Operating parameters

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	-30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194°F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Electrical acting ECO 80 modules

Closed Center EVP with PPRV theoretical performance graphs

Pressure relief valve characteristics



Part numbers	P-port	T-port	M-, LS-port	Mounting
11172997	G 1/2	G 1/2	G 1/4	M8 x 1.25
11173011	7/8-14 UNF	7/8-14 UNF	9/16-18 UNF	M8 x 1.25

Electrical acting ECO 80 modules

EVP inlet module accessories

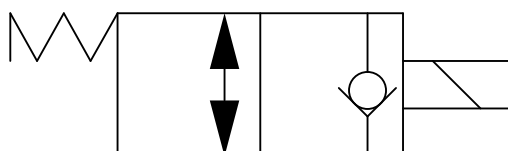
The generic EVP inlet module accessory platform includes the EVPX electrical LS pressure unloading valve and a plug for external pilot oil supply.

- EVPX electrical LS pressure unloading valve
- Plug for external pilot oil supply

EVPX electrical LS pressure unloading valve

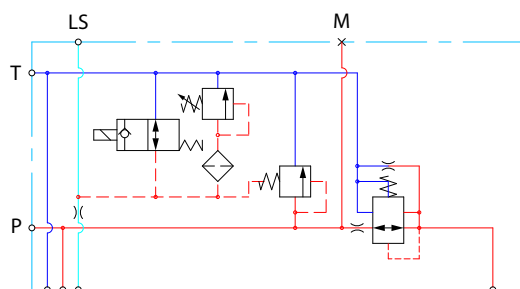
The electrical LS pressure unloading valve is an accessory available for EVP inlet modules with EVPX facility. The EVPX consist of a solenoid valve and a magnetic coil package, allowing the operator to relieve the LS pressure to tank electrically.

Normally open (NO)



Relieving the LS pressure to tank results in a reduced system pressure level, which is determined by the sum of the tank and neutral by-pass pressure drop in an Open Center PVP configuration.

Open center EVP with PPRV and EVPX (NO)



Technical specifications

Voltage supply	12/24 V \pm 10 %
Resistance @ 12 V	7.2 Ω \pm 7 %
Resistance @ 24 V	28.2 Ω \pm 7 %
Power consumption	20 W
Maximum LS response time	300 ms
Max. pressure drop @ 0.1 l/min [2.6 US gal/min]	2 bar [30 psi]
Max. coil surface temperature	155°C [311°F]

Part numbers

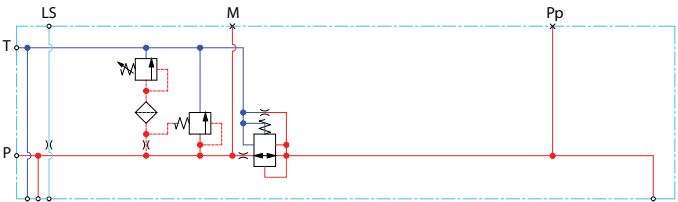
Part number	Description	Voltage supply	Thread
11172430	EVPX	12 V	-
11172429	EVPX	24 V	-

Electrical acting ECO 80 modules

Plug for external pilot oil supply

The plug for external pilot oil supply is an accessory available for EVP inlet modules with integrated pilot pressure reducing valve (PPRV), this plug consists in a connection to send out of the EVP inlet a signal with 27 bar and 5 l/min.

Closed center EVP with PPRV and Pp-port



Closed center EVP with PPRV and Pp-port

Part number	Description	Voltage supply	Thread
11177014	Plug for external pilot oil supply	-	G1/4-19 in
11177013	Plug for external pilot oil supply	-	9/16-18 UNF

Electrical acting ECO 80 modules

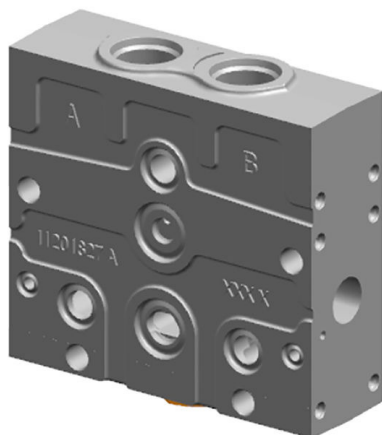
EVB basic modules - electrical actuation

EVB body design

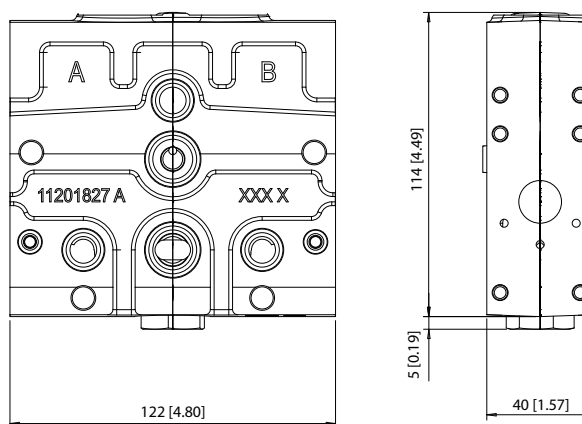
The EVB Body Design, is intended for controlling a work function where the function behavior in terms of flow and pressures allows dependency on the load pressure of other functions used simultaneously.

The integrated load drop check valve, at EVB with PVLP Facilities, prevents flow back from work ports influencing other functions. The EVB without PVLP Facilities has the same cast body as the EVB with PVLP Facilities but without the machined ports to the option of adding PVLP/PVLA to the work section.

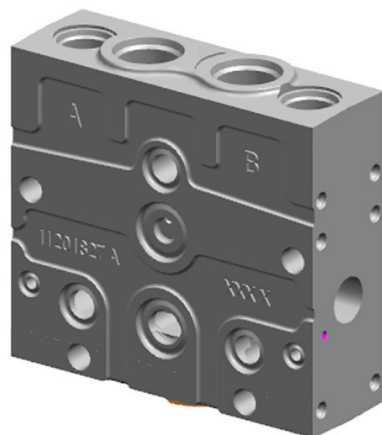
EVB without PVLP module



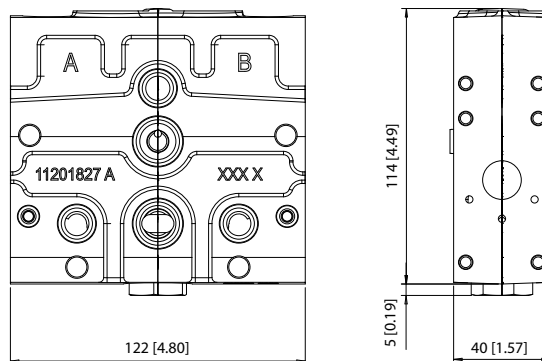
EVB without PVLP dimensions



EVB with PVLP module



EVB with PVLP dimensions



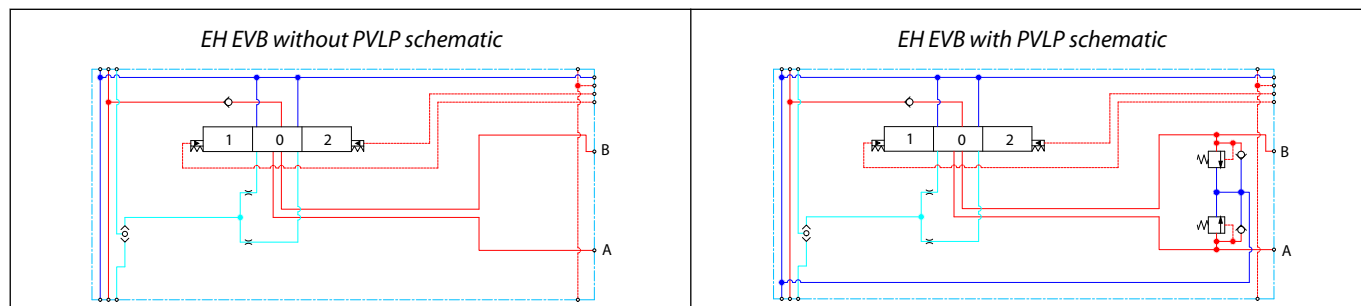
The EVB basic module variants are based on a generic platform with a selection of additional features, enabling you to tailor the EVB to suit the demands of any hydraulic system:

- Electro-hydraulic EVB without PVLP
- Electro-hydraulic EVB medium body

EVB body features

- Integrated LS shuttle network
- Load drop check valve
- Shock/anti-cavitation valve and suction facility (PVLP/PVLA)

Electrical acting ECO 80 modules



Technical specifications for port A/B

Max. continuous pressure	Max. intermittent pressure	Max. rated flow
280 bar [4061 psi]	320 bar [4641 psi]	100 l/min [26.4 US gal/min]

Technical specifications

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for electro-hydraulic acting EVB basic modules

Part numbers	A/B – thread port	Facilities for shock valves A/B
11225786	7/8-14 UNF	No
11225788	7/8-14 UNF	Yes
11225787	G 1/2	No
11225789	G 1/2	Yes

EVB basic modules accessories

The generic EVB module accessory platform include the PVLP shock and anti-cavitation valve and PVLA suction valve.

- PVLP Shock and Anti-Cavitation Valve
- PVLA Suction Valve
- Cavity plug

PVLP shock/anti-cavitation valve

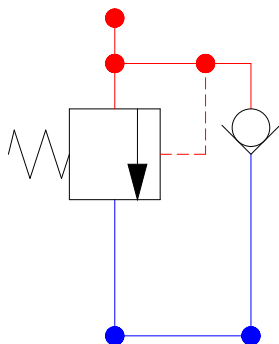
The PVLP will relief a pressure peak to the internal tank galleries and will furthermore suck oil from the tank to the work port to prevent cavitation. Pressure settings range 32-320 bar [460-4641 psi].

Electrical acting ECO 80 modules

Features

- Shock valve
- Anti-cavitation

PVLP schematic



Technical specifications

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers for fixed PVLP

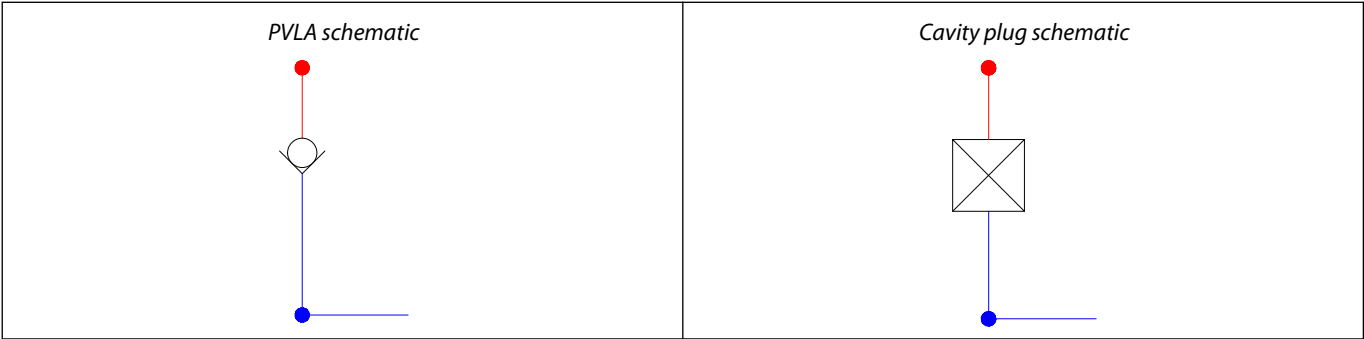
Part number	Pressure setting in bar [psi]	Part number	Pressure setting in bar [psi]
157B2032	32 [460]	157B2190	190 [2755]
157B2050	50 [725]	157B2210	210 [3045]
157B2063	63 [914]	157B2230	230 [3335]
157B2080	80 [1160]	157B2240	240 [3480]
157B2100	100 [1450]	157B2250	250 [3625]
157B2125	125 [1813]	157B2265	265 [3845]
157B2140	140 [2031]	157B2280	280 [4061]
157B2150	150 [2175]	157B2300	300 [4351]
157B2160	160 [2320]	157B2320	320 [4641]
157B2175	175 [2538]		

PVLA suction valve and cavity plug

The PVLA will suck oil from the tank to the work port to prevent cavitation by the 0.5 bar spring. The plug will ensure that when using a single acting spool, all flow returning through the work port is led to tank.

Technical Information
ECO 80 7mm Directional Control Valve

Electrical acting ECO 80 modules



Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

PVLA	Cavity plug
157B2001	11177714

Electrical spools

EVBS electrical flow control spools

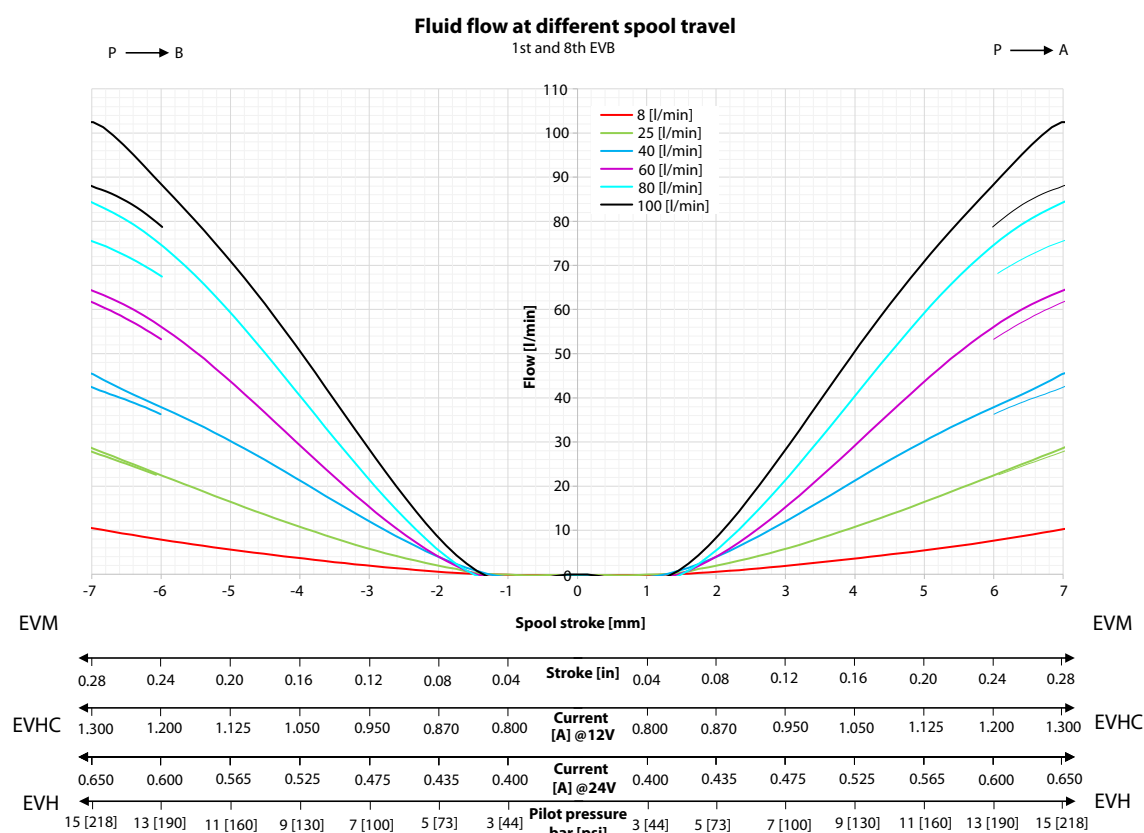
The electrical acting EVBS spools determine the flow out of the work section and are based on a generic platform with a wide selection of additional features, allowing for a customized EVBS that meets the demands of any hydraulic system and any function.

The electrical acting EVBS spool comes in the following different main variants:

- EVBS electrical flow control spool
- EVBS electrical flow control spool with soft spring
- EVBS EVPN Spool
- EVBS, EH proportional friction detent spools (EVMR)

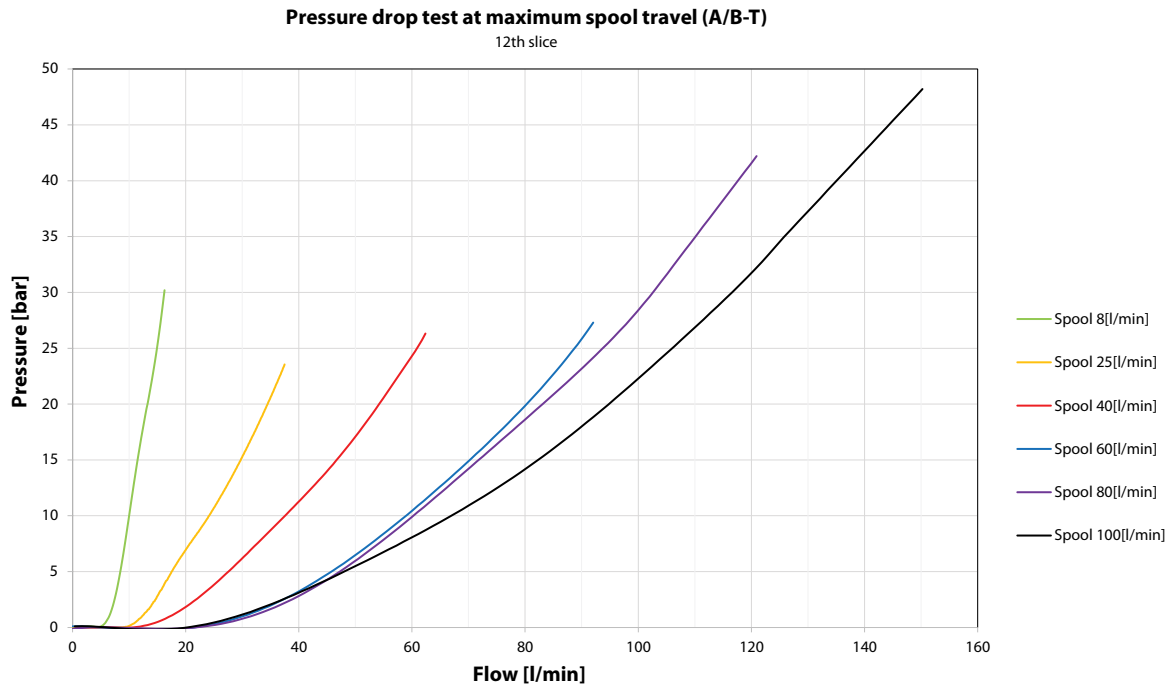
EVBS fluid flow characteristics - Theoretical performance

Oil flow as a function of spool travel @ 15 bar margin



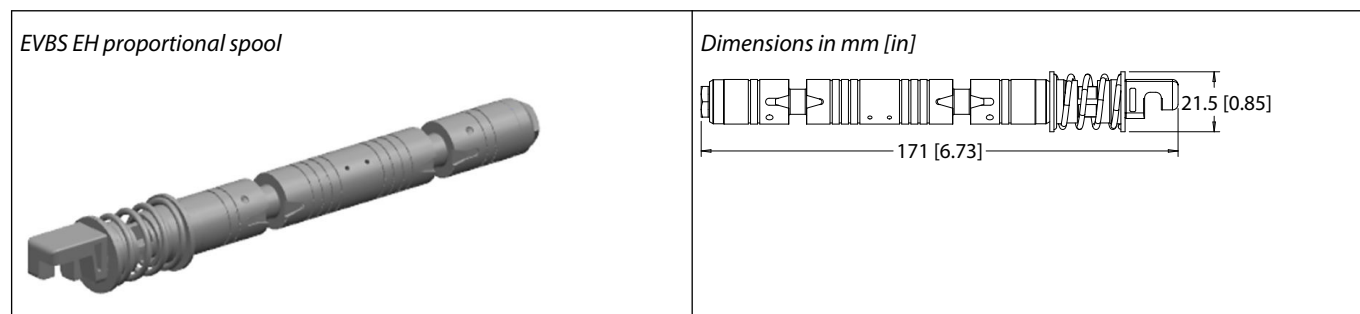
Electrical spools

Pressure drop at maximum spool travel (A/B-T)


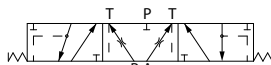
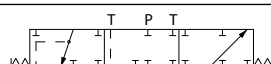


Electrical spools

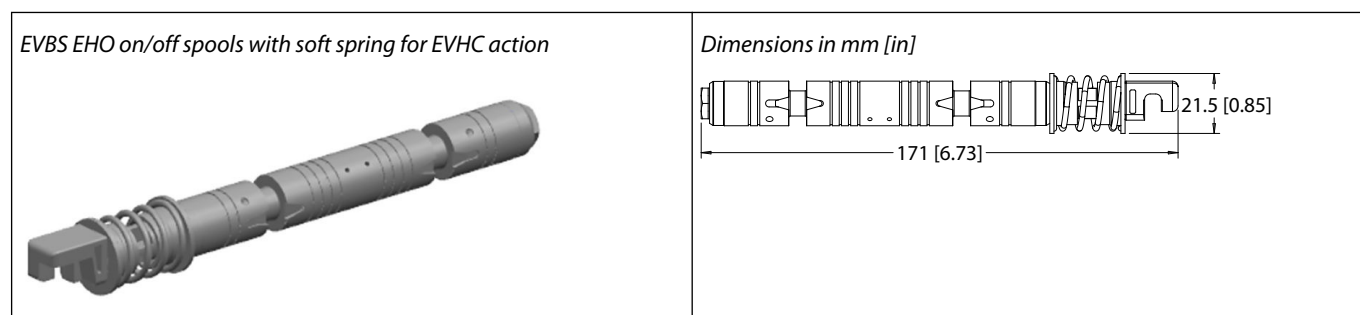
EVBS EH - proportional spools



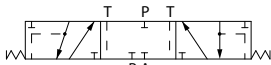
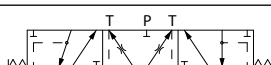

Part numbers for EVBS EH proportional spools

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11222775	11222778	11222782	11222785	11222788	11222791
4-way, 3-position Throttled open neutral position		11222774	11222777	11222781	11222784	11222787	11222790
3-way, 3-position Closed neutral position		11222776	11222780	11222783	11222786	11222789	11222792

EVBS EHO - on/off spools with soft spring

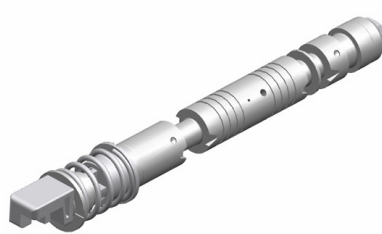
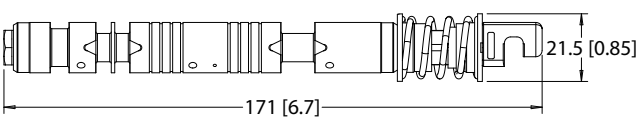


Part numbers of EVBS EHO on/off spools with soft spring

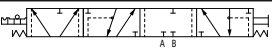
Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11225310	11225313	11225316	11225319	11225322	11225325
4-way, 3-position Throttled open neutral position		11225309	11225312	11225315	11225318	11225321	11225324
3-way, 3-position Closed neutral position		11225311	11225314	11225317	11225320	11225323	11225326

Electrical spools

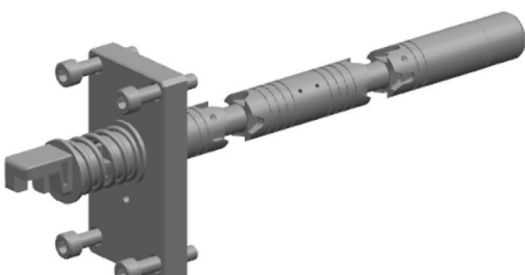
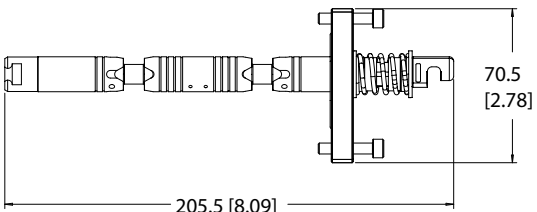
EVBS EH - float proportional spools

<p>EVBS EH - float proportional spools</p> 	<p>Dimensions in mm [in]</p> 
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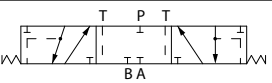
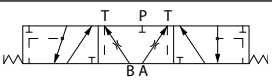
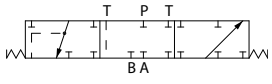
Part numbers

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way. 4-position Float, P > A > F		-	-	11225684	-	11225686	-

EVBS EH - pneumatic spools for EVPN

<p>EVBS EH - pneumatic spools for EVPN</p> 	<p>Dimensions in mm [in]</p> 
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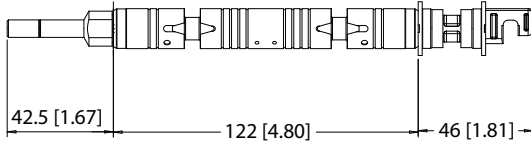
Part numbers

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way. 3-position Closed neutral position		-	-	11229180	-	11229183	-
4-way. 3-position Throttled open neutral position		-	-	11229179	-	11229182	-
3-way. 3-position Closed neutral position		-	-	11229181	-	11229184	-

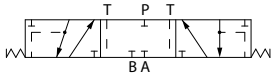
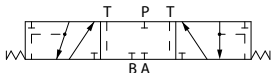
Technical Information
ECO 80 7mm Directional Control Valve

Electrical spools

EVBS EH - friction detent spools (EVMR)

<p>Friction detent spool (EVMR)</p> 	<p>Dimensions in mm [in]</p> 
--	---

Part numbers

Type	Schematic	Flow, l/min [US gal/min]					
		8 [2.11]	25 [6.61]	40 [10.57]	60 [15.85]	80 [21.13]	100 [26.42]
4-way, 3-position Closed neutral position		11248101	11248103	11248105	11248107	11248109	11248111
4-way, 3-position Throttled open neutral position		11248100	11248102	11248104	11248106	11248108	11248110

Actuation

EVM mechanical actuation

The EVM consists of an aluminum base with a lever mounted on the end of the valve spool on side B. When actuating the lever the operator is directly pulling or pushing on the main spool inside the valve hence controlling the flow. Actuating the lever fully will move the spool all 7mm and give full flow. The lever can be mounted / removed without having to remove the EVM base. The EVM should be used with Electrical flow control spools and can be combined with any EVHC, EVH or Pneumatic actuator.

Available options:

- EVM without adjustment screws
- EVM with adjustment screws

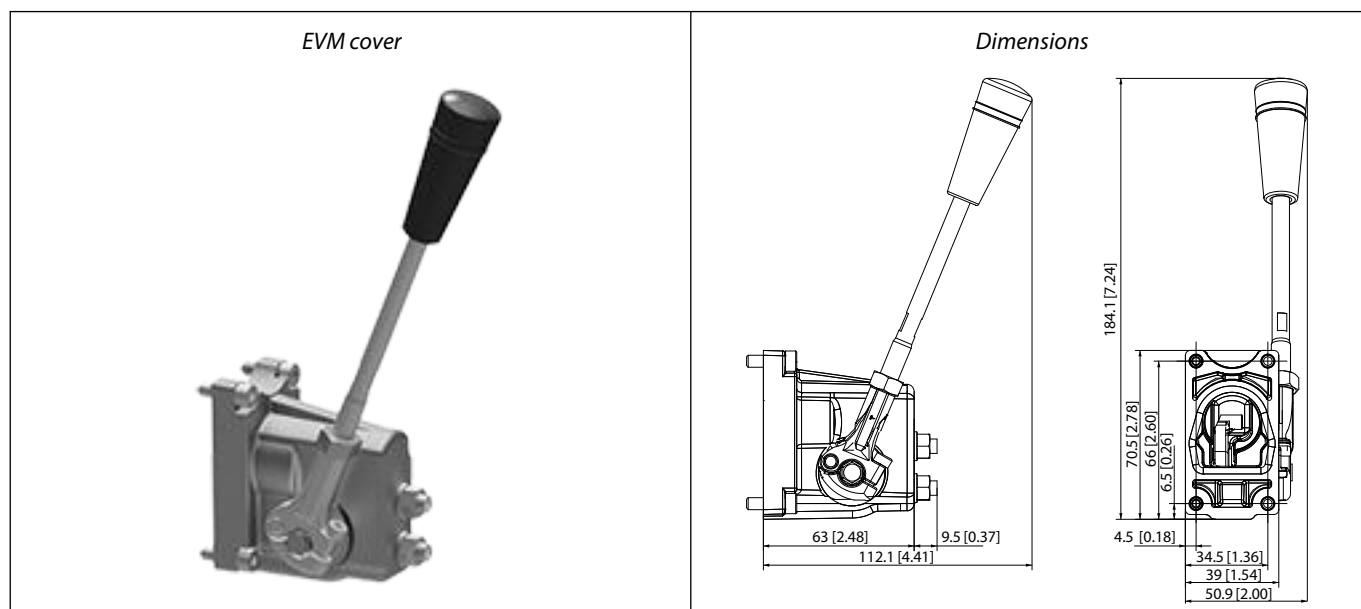
EVM without adjustment screws

The standard EVM without adjustment screws will allow a spool travel of 7mm in either direction. Full lever movement to one side will give full flow to the work ports. When the spool is moved 5mm it will stop due to a mechanical limitation build into the EVM base.

EVM with adjustment screws

The spool travel in either direction can be limited by the adjustment screws. This will limit the flow out of the work ports thereby reducing the speed of an application. The spool travel is adjusted by first loosening the nut then adjusting the pin screw. After adjustment the nut must be tightened again applying 8 ± 1 [N·m] of torque.

EVM dimensions, torque, and part numbers



Operating torque

Spool displacement	Operating torque for EVM + EVHC and EVM + EVH	Operating torque for EVM + EVHCO
From neutral position	1.5 ± 0.2 N·m [13.3 \pm 1.8 in-lbs]	2 ± 0.2 N·m [17.7 \pm 1.8 in-lbs]
Maximum spool travel	6.6 ± 0.2 N·m [58.4 \pm 1.8 in-lbs]	2.7 ± 0.2 N·m [23.9 \pm 1.8 in-lbs]
No control lever position	2 x 6	
Control lever range	$\pm 13.8^\circ$	

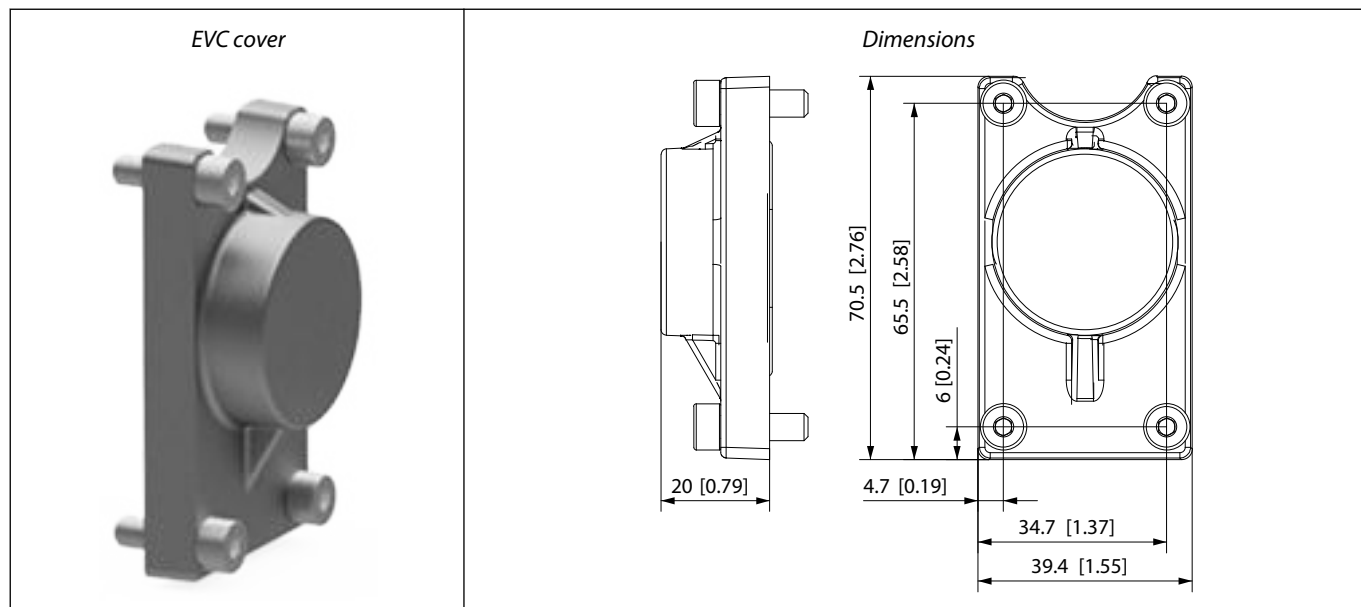
Actuation*Part numbers*

Part number	Description	Lever	Adjustment screws
11119157	EVM-ACTUATOR	-	-
11167001	EVM-ACTUATOR-LEVER	Yes	-
11145204	EVM-ACTUATOR-ADJ SCREW	-	Yes
11167002	EVM-ACTUATOR-ADJ SCREW-LEVER	Yes	Yes

Actuation

EVC - cover for mechanical actuation

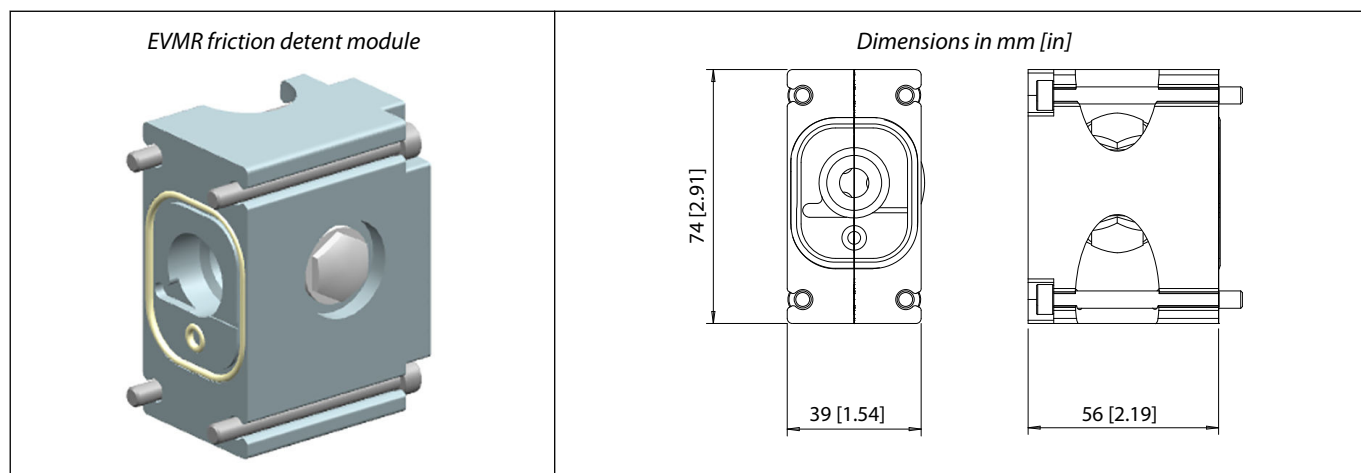
The EVC is an aluminum plate mounted on the end of the valve slice on side A for purely mechanically operated valve with EVM style. The EVC is to be combined with an EVM.



Part numbers

Part number	Description
11171318	EVC-COVER

EVMR friction detent module for EH bodies (closed end spool style)



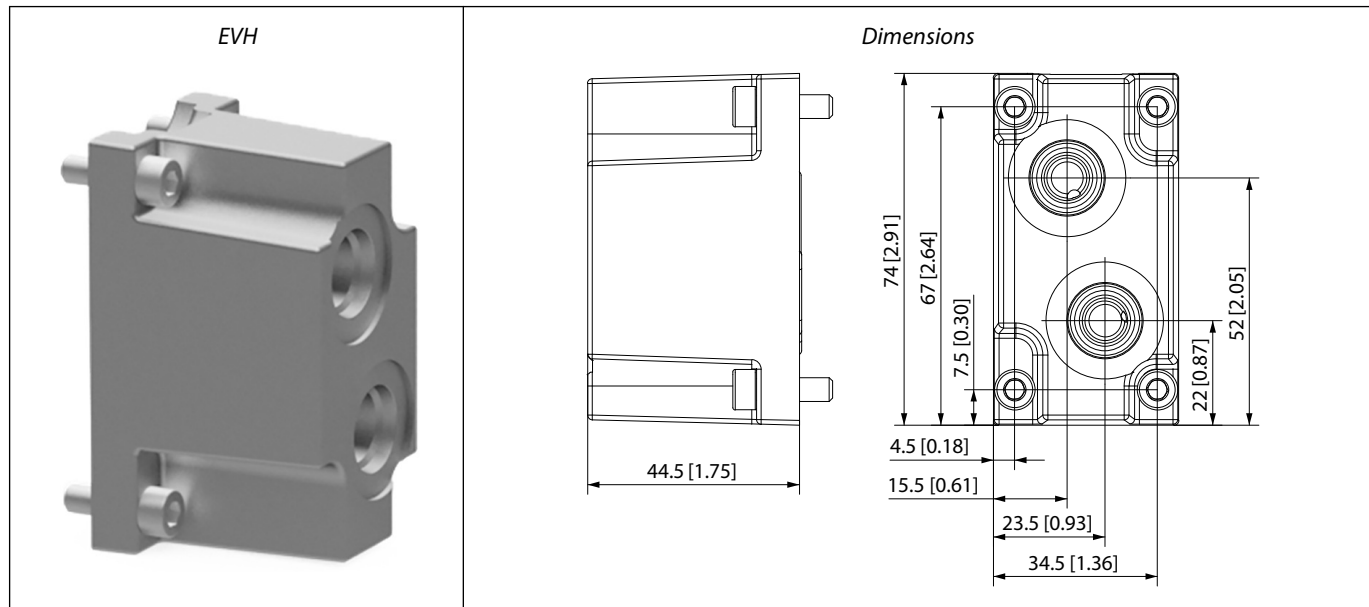
Part numbers

Part number	Description
11245644	EVMR, friction detent

Actuation

EVH - hydraulic actuation

The EVH is an aluminum plate with two threaded connections mounted on the end of the valve slice on side A. When applying pressure through one of the ports, one side of the spool is pushed to one direction hence flow is coming from the work ports. The EVH is to be combined with an EVM.



Technical data

Control range pressure from neutral to max A/B	3.5-18 bar [50-261 psi]
Maximum pilot pressure	35 bar [507 psi]
Maximum pressure on port T¹	10 bar [145 psi]

¹ The hydraulic remote-control lever should be connected directly to tank

Part numbers

Part number	Name	Connection
11169486	EVH-ACTUATOR-BSP	1/4 BSP
11169487	EVH-ACTUATOR-SAE	9/16 SAE

Actuation

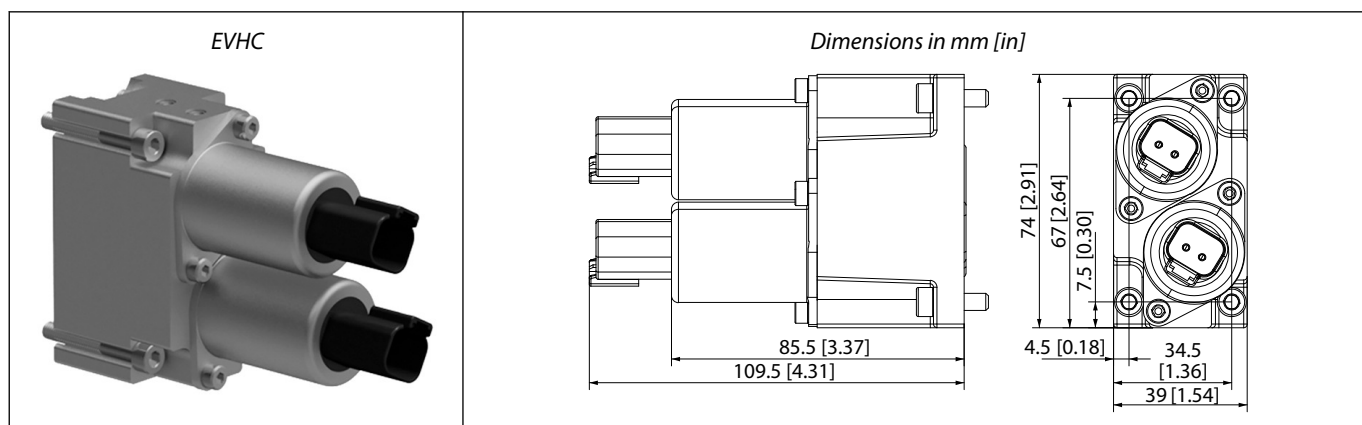
EVHC - electrical actuation

The EVHC consists of an aluminum base with two solenoids pressure reducing valves mounted on the end of the valve slice. When actuating with electrical proportional actuation, the main spool position is adjusted so that its position corresponds to an electrical control signal.

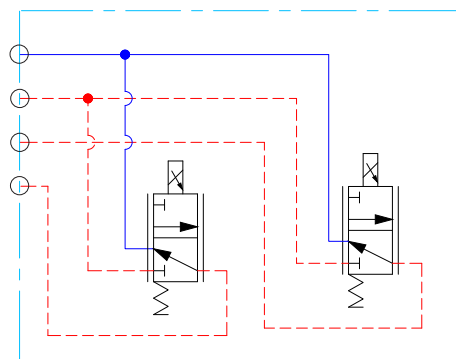
The control signal is converted into a hydraulic pressure signal that moves the main spool in the EVB. This is done by means of two proportional pressure-reducing valves. The electrical actuator can be controlled either by a current amplifier card, or directly from a programmable microcontroller.

The actuator controls the spool by building up pilot oil pressure on the end of the spool. For the EVHC is necessary a pilot oil pressure between 25 and 30 bar.

The EVHC should be used with Electrical Flow Control spools and can be combined with any EVM.

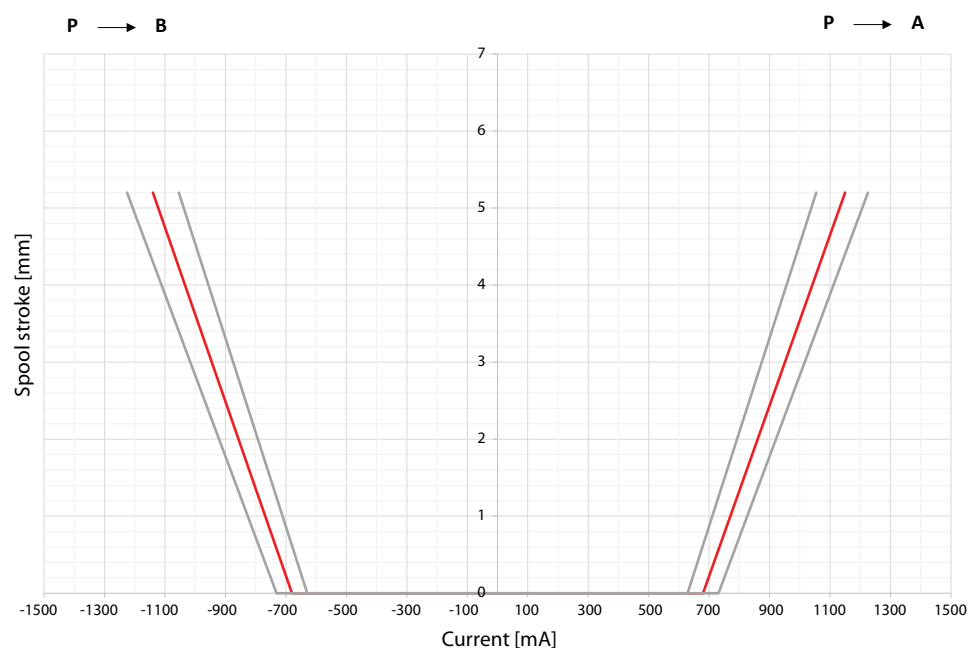


Schematic

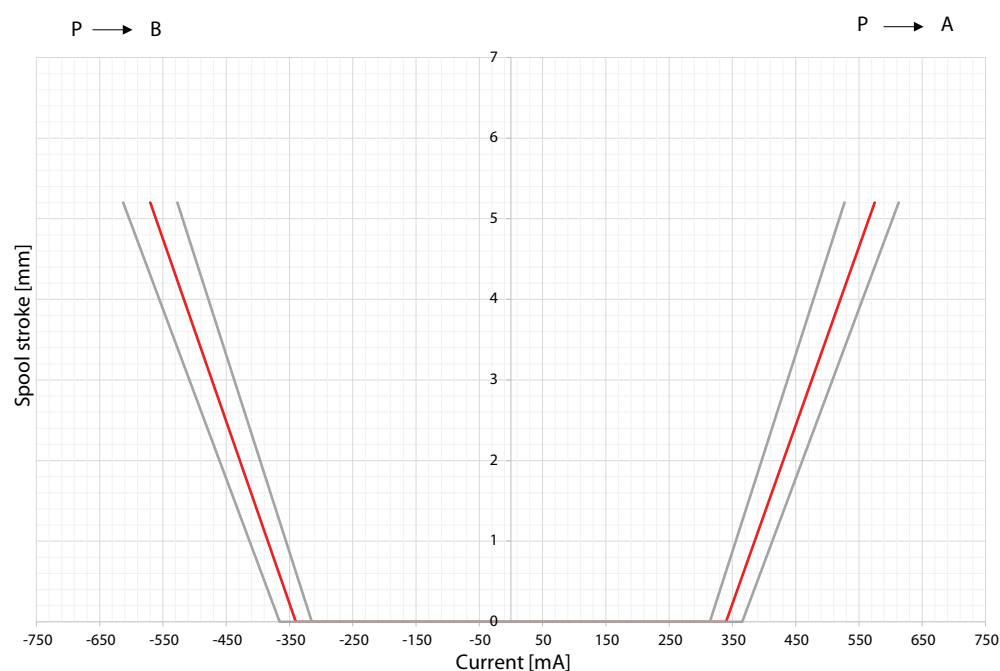


Actuation

EVHC 7mm spool stroke vs 12V current



EVHC 7mm spool stroke vs 24V current



EVHC current response and hysteresis @ 25 bar Pp, 32 ctS, 55 °C. The ideal curve (red line) is determined by the main spool neutral spring. The EVHC hysteresis is around $\pm 7.5\%$ (grey region).

The hysteresis is affected by viscosity, friction, flow forces, dither frequency and modulation frequency. The spool position will shift when conditions are changed e.g. temperature change.

Technical Information
ECO 80 7mm Directional Control Valve

Actuation

Technical data

Parameter	Supply voltage	
	12 V	24 V
Controller output current range	0 - 1500 mA	0 - 750 mA
Resistance	4.75 $\Omega \pm 5\%$	20.8 $\Omega \pm 5\%$
Frequency	100 - 400 Hz	
Pilot oil pressure range	25 - 30 bar [362 - 435 psi]	
Pressure control range	8 - 23 bar [116 - 333 psi]	
Ambient temperature range	-30°C to 80°C [-22 °F to 176°F]	
Temperature range	-20°C to 80°C [-4 °F to 176°F]	
Fluid cleanliness	23/19/16 (according to ISO 4406)	

Operating conditions

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		
Reaction time from neutral position to max. spool travel	Max. 300 ms		
Reaction time from max. spool travel to neutral position	Max. 600 ms		

Part numbers

Part number	Voltage supply	Connector type	Protection class
11162297	12 V	2x2 DEUTSCH	IP 67
11162298	24 V	2x2 DEUTSCH	IP 67

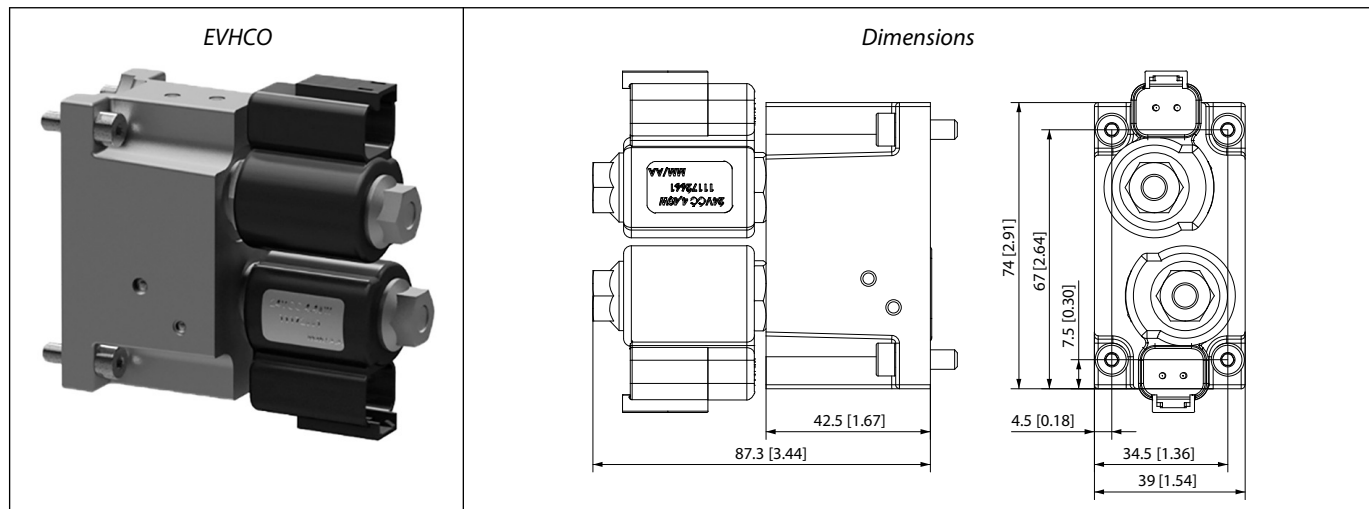
Actuation

EVHCO - Low current on/off electrical actuation

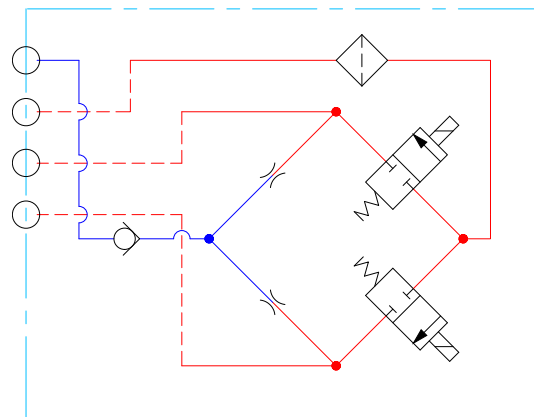
The EVHCO consists of an aluminum base with two solenoid valves mounted on the end of the valve slice. When active with electrical signal the main spool goes straight to end of stroke, A or B side.

The electrical signal is converted into a hydraulic pressure signal that moves the main spool in the EVB. This is done by means of two on/off solenoid valves.

The actuator controls the spool by building up pilot oil pressure on the end of the spool. For the EVHCO is necessary a pilot oil pressure between 10 and 28 bar. The EVHCO should be used with Electrical flow control soft spring spools and can be combined with any EVM.



Schematic



Technical data

Parameter	Rated	12 V	24 V
Supply voltage (Udc)	Range	10.8 to 15 VDC	22 to 28 VDC
Current	22°C [71°F]– Coil temperature	660 mA	330 mA
Power	22°C [71°F]– Coil temperature	8W	8W
Resistance at 20°C [68°F]		18 Ω ±10%	72 Ω ±10%
Pressure control range		10 – 28 bar [145 – 406 psi]	
Duty cycle		100 %	

Technical Information
ECO 80 7mm Directional Control Valve

Actuation

Technical data (continued)

Parameter	Rated	12 V	24 V
Reaction time from neutral position to max. spool travel		Max. 300 ms	
Reaction time from max. spool travel to neutral position		Max. 600 ms	

Operating conditions

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

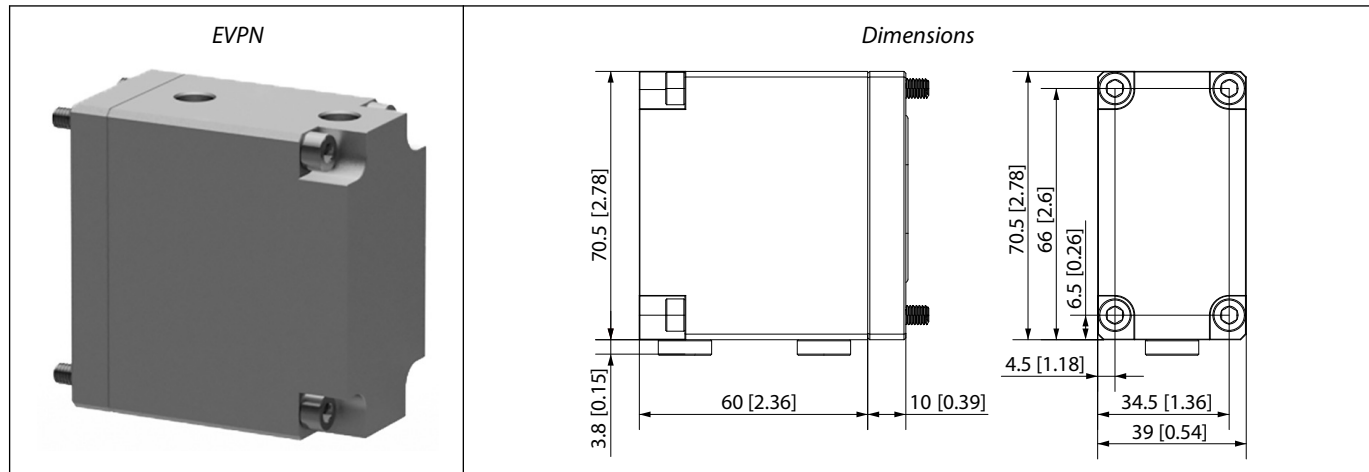
Part numbers

Part number	Voltage supply	Connector type	Protection class
11186922	12 V	2x2 DEUTSCH	IP 67
11186911	24 V	2x2 DEUTSCH	IP 67

Actuation

EVPN - pneumatic actuation

The EVPN is an aluminum plate with two threaded connections mounted on the end of the valve slice on side A. When applying pressure through one of the ports, one side of the spool is pushed to one direction hence flow is coming from the work ports. The EVPN is to be combined with an EVM and a special EVBS spool for EVPN.



The two plugs in the bottom of the EVPN actuator is for option mount for upside down pneumatic ports.

Technical data

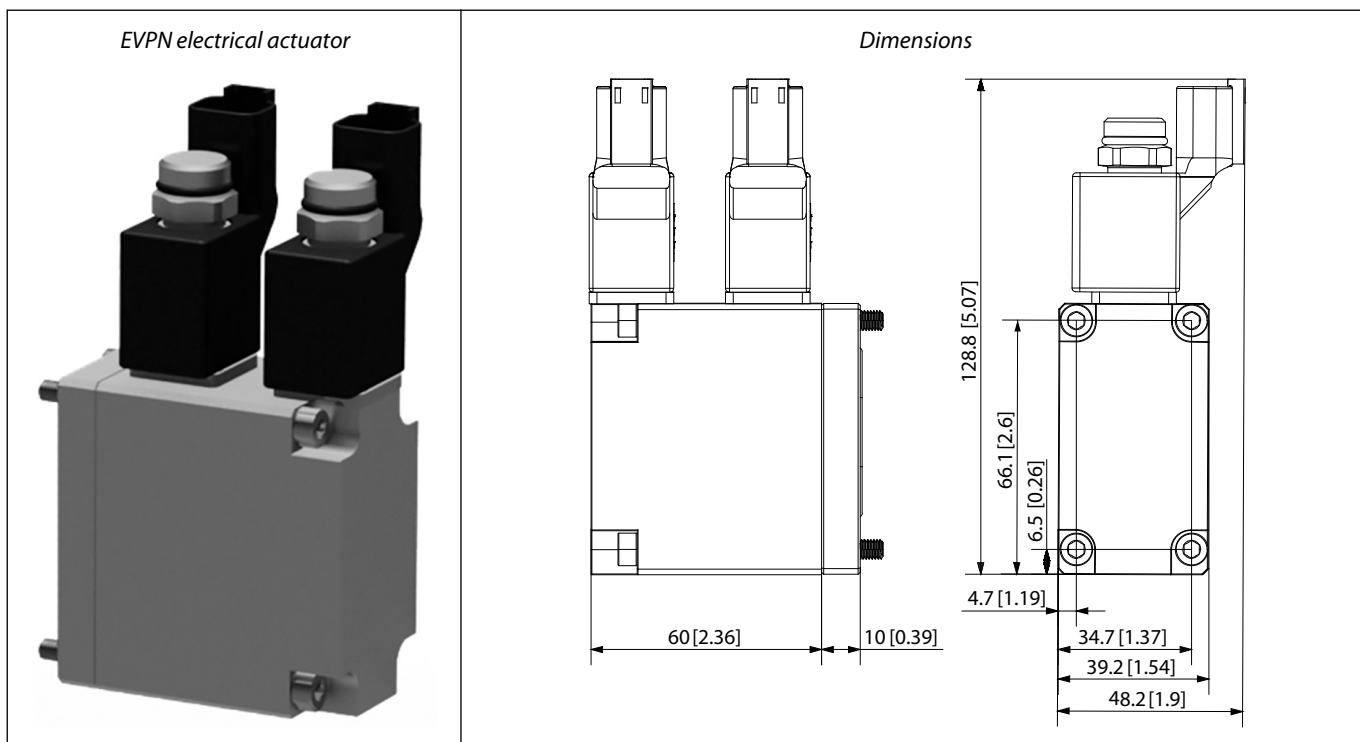
Pilot air supply	Minimum	5 bar [72 psi]
	Maximum	21 bar [304 psi]

Part numbers

Part number	Name	Port size
11198492	EVPN Pneumatic actuator	1/8 BSP

Actuation

EVPN - electrical pneumatic action



Operating conditions

Pilot air supply	Minimum	5 bar [72 psi]
	Maximum	12 bar [174 psi]

Control specifications

Parameter	Rated	12 Vdc	24 Vdc
Supply Voltage (Udc)	Range	11 to 15 Vdc	22 to 30 Vdc
Current	22°C [71°F]– Coil temperature	500 mA	250 mA
Power	22°C [71°F]– Coil temperature	6 W	6 W
Resistance		24 Ω	96 Ω
Reaction time from neutral position to max. spool travel		Max. 50 ms	

Technical specifications

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Actuation

Part numbers

Part number	Voltage supply	Connector type	Protection class
11193722	12 V	DEUTSCH	IP 67
11193723	24 V	DEUTSCH	IP 67
11194345	24 V	AMP	IP 66

End plate for electrical modules

The ECO80 EVO end plates close off the valve stack section by placing them at the end. Furthermore, the end plate is ensuring Load Sense (LS) is relieved to tank pressure when the valve is not operated.

The EVO end plate variants are based on a generic platform with a selection of additional features, enabling you to tailor the EVO to suit the demands of any hydraulic system.

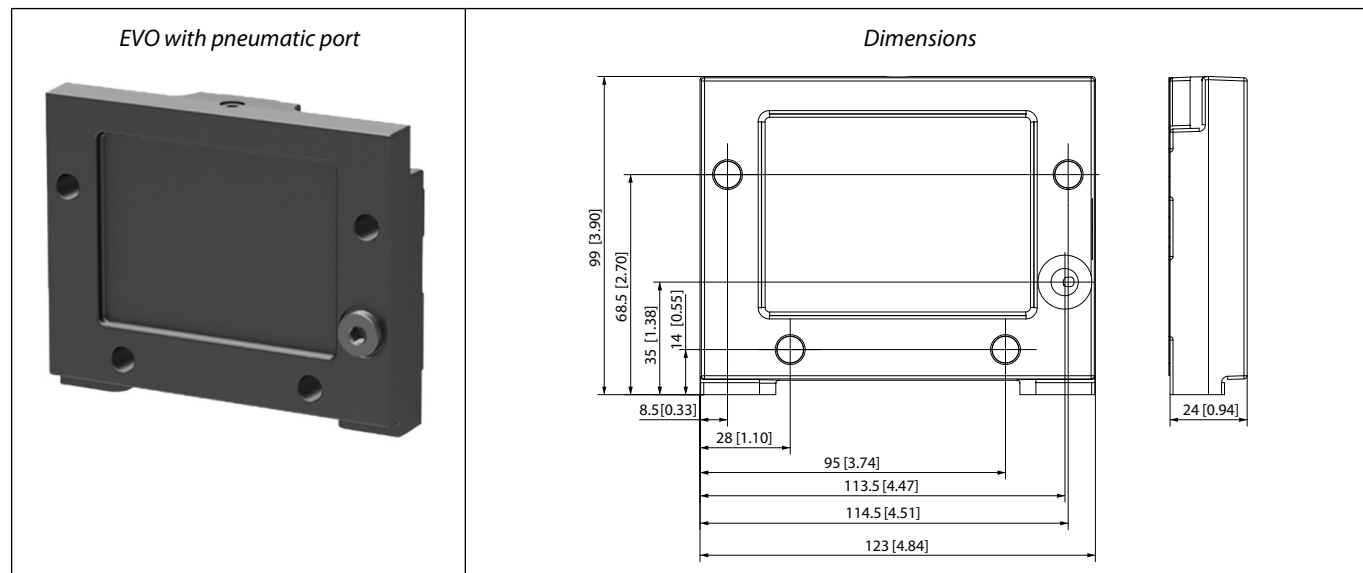
The EVO end plate platform for electrical modules include the following main variant.

- EVO with pneumatic port

End plate for electrical modules

EVO with pneumatic port

The EVO end plate closes off the valve stack section by placing it at the end. Furthermore, the end plate is ensuring Load Sense (LS) is relieved to tank pressure when the valve is not operated. The pneumatic port works as air inlet supply for when using the electro pneumatic actuator.



Schematic



Technical specification

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers

Part number	Description	Pneumatic port	Mounting
11191584	EVO End plate with pneumatic port	G1/8-28	M8

High power carry over

EVB to ECO80LS HPCO

The EVB HPCO - ECO80LS high power carry over is designed to deliver excess pump flow downstream of the ECO80LS valve to other open center valves.

Benefits

- Manages all open center (fixed) pump flow while adding priority to ECO80LS functions
- Reduces the number of pumps and plumbing connections to multiple open center valves

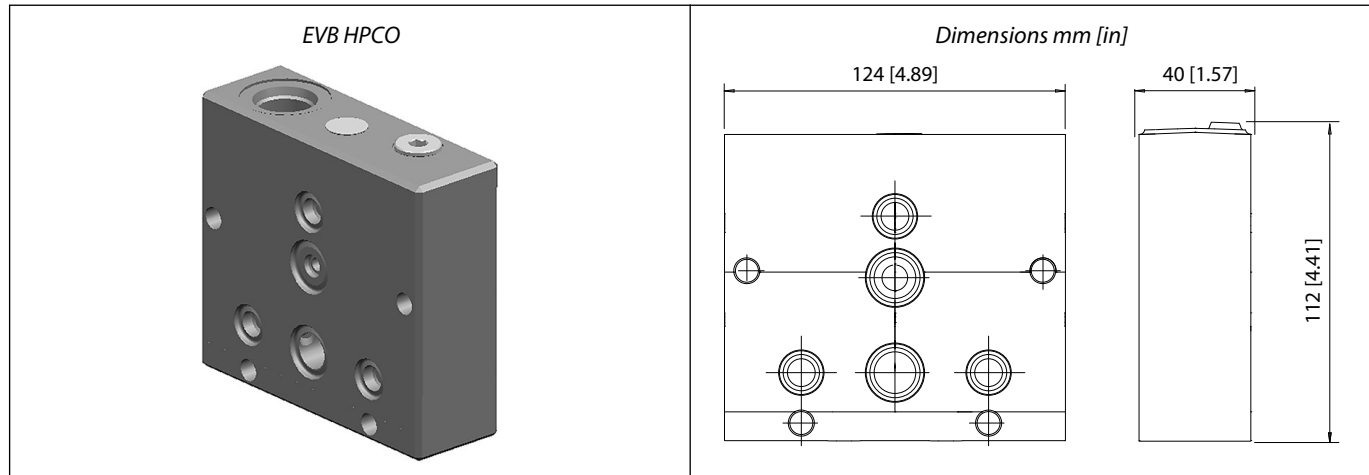
Features

- Full pressure and flow available to downstream open center valve while ECO80LS valve sections are not in use.
- Enables the standard EVP inlet "T" port to function as "HPCO" port
- Includes "T" port for ECO80LS return flow to reservoir
- Includes pilot supply referenced to reservoir eliminating the need for EVP inlet pilot supply
- Includes adjustable LS relief referenced to reservoir controlling max working pressure to ECO80LS valve
- Include fixed shock valve (PVLP) referenced to reservoir controlling max pressure to downstream open center valve

Technical Information ECO 80 7mm Directional Control Valve

High power carry over

EVB HPCO technical data



Schematic



Technical specifications

Parameter	Minimum	Recommended range	Maximum
Fluid temperature	- 30°C [-22°F]	30 to 60°C [86 to 140°F]	90°C [194 °F]
Fluid viscosity	4 mm ² /s [39 SUS]	12 to 75 mm ² /s [65 to 347 SUS]	460 mm ² /s [2128 SUS]
Fluid cleanliness	23/19/16 (according to ISO 4406)		
Operating temperature	Ambient: -30 to 60°C [-22 to 140°F]		

Part numbers

Part number	Description
11226551	EVB80LS-HPCO – SAE – #10 PORT
11226582	EVB80LS-HPCO – BSP - 1/2" PORT

PVG 32/ECO 80 interface

EVGI

The EVGI Interface enhances ECO80LS with PVG32 and PVG16 performance features.

The EVGI, PVG32/ECO80 Interface combines PVG 32, PVG16 and ECO 80 into a single valve group. Both PVG32 and ECO80LS assembly kits fasten into the EVGI module. The EVGI is compatible with T0 or non-T0 PVG32 modules.

Benefits

- Increased fixed and variable pump flow capacity from PVG32 standard and mid-inlet
- Increased safety disabling downstream ECO80LS functions using PVSKM
- Prioritize downstream ECO80LS functions using PVSPM

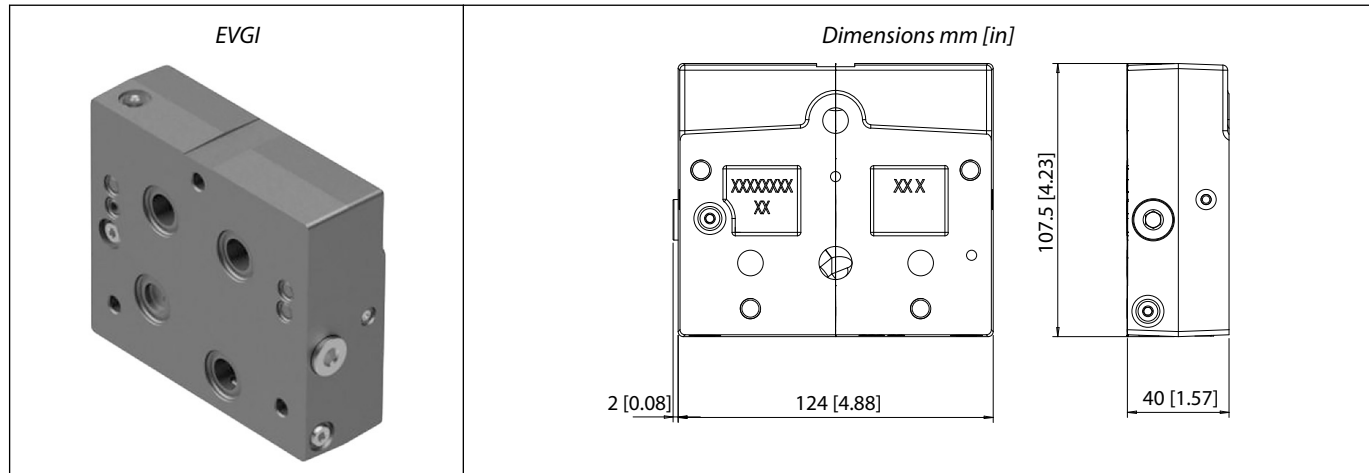
Features

- Independent Pilot Pressure Reducing Valve for ECO80 EVHC / EVHCO actuation
- Designed to align to single mounting surface

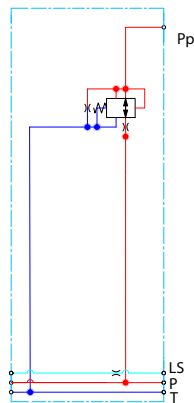
Technical Information
ECO 80 7mm Directional Control Valve

PVG 32/ECO 80 interface

EVGI technical data



Schematic



Operating conditions

Pump Pressure	Maximum	280 bar
Tank pressure (bar)	Static	25 bar
	Dynamic	40 bar
Pilot Pressure at ECO side	Maximum	28 bar
Oil temperature (°C)	Recommended	30 → 60 °C
	Minimum	-30 °C
	Maximum	90 °C
Ambient temperature	Minimum	-30 °C
	Maximum	60 °C
Oil viscosity	Operating range	12 - 75 mm ² /s
	Minimum viscosity	4 mm ² /s
	Maximum viscosity	460 mm ² /s

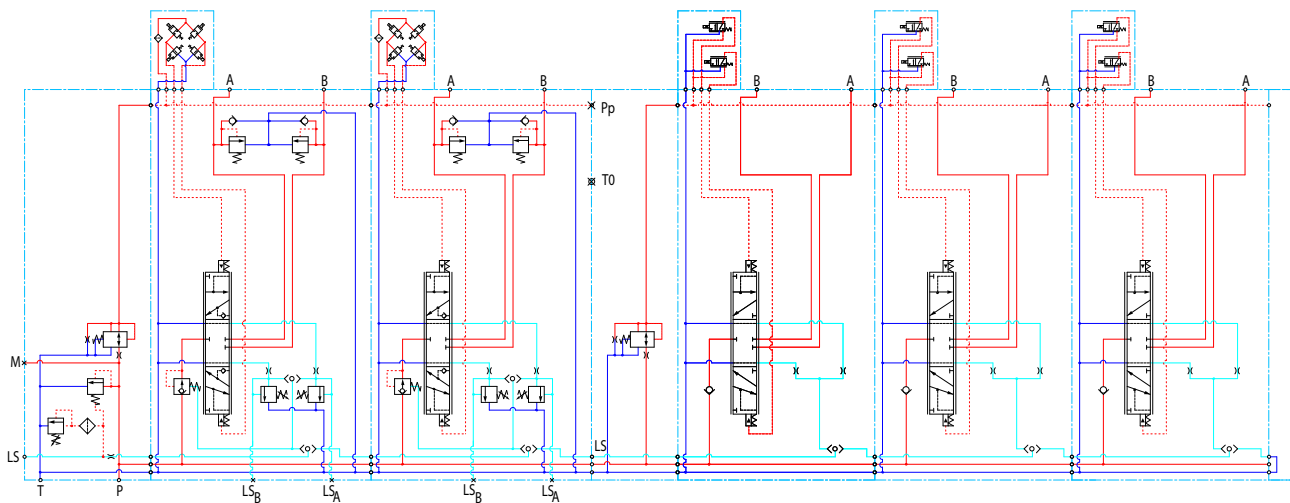
Part number

Part number	Description
11202147	EVGI-INTERFACE-ECO80LS-PPRV-A

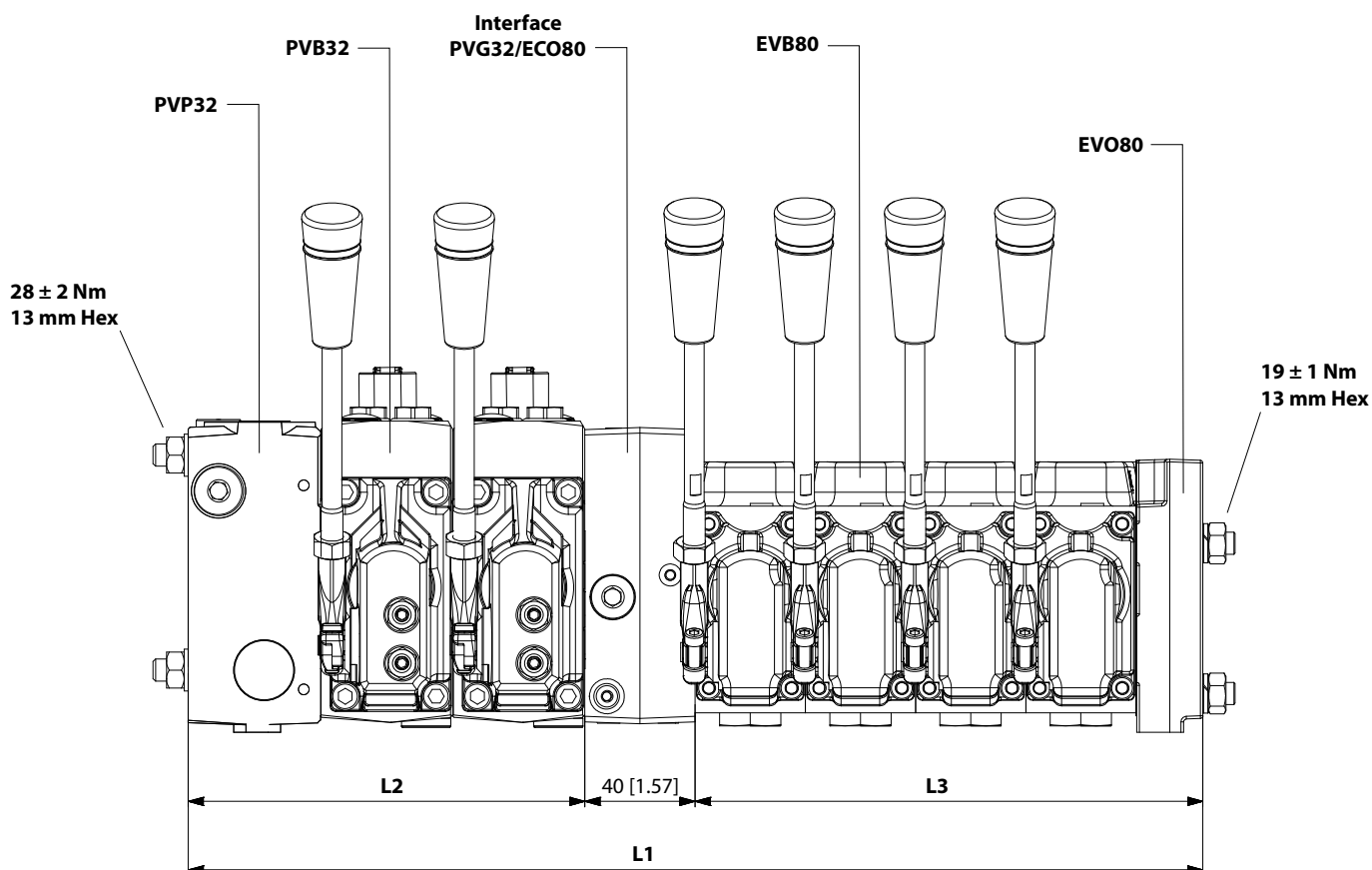
PVG 32/ECO 80 interface

PVG 32/ECO 80 combination

Schematic



Dimensions



There is a possibility of thread failure.
Do not mix tie rod parts (such as tie rod bars, nuts, and washers).

PVG 32/ECO 80 interface**How to order PVG 32/ECO 80 assembly kits**

Specify the length of the valve stack.

Maximum valve stack length allowed

PVG/ECO Maximum Stack valve length allowed: L1 [mm] L1 = L2 + L3 + 40 mm	632 mm
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See [ECO 80 assembly kit numbers](#) on page 71 for L2 and L3 lengths and part numbers.

Technical Information

ECO 80 7mm Directional Control Valve

Ordering information

ECO 80 assembly kit numbers

The PVG maximum length allowed depends on the number of EVB80s used.

ECO assembly kit numbers for PVG length

EVB80 quantity	1	2	3	4	5	6	7	8	9	10	11	12
ECO length: L3 [mm]	64	104	144	184	224	264	304	344	384	424	464	504
EVT 80 kit number	-	111731 02	111731 03	111731 04	111731 05	111731 06	111731 07	111731 08	111731 09	111731 10	111731 11	111731 12

PVG length determination

PVG maximum length based on EVB80 quantity ($L2 = L1 - L3 - 40\text{mm}$)

L2 [mm]	528	488	448	408	368	328	288	248	208	168	128	88
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L2 length (mm) based on the PVB quantity

Module quantity: PVB16 across PVB32 down	0	1	2	3	4	5	6	7	8	9	10	11	12
0	48	88	128	168	208	248	288	328	368	408	448	488	528
1	96	136	176	216	256	296	336	376	416	456	496	-	-
2	144	184	224	264	304	344	384	424	464	504	-	-	-
3	192	232	272	312	352	392	432	472	512	-	-	-	-
4	240	280	320	360	400	440	480	520	-	-	-	-	-
5	288	328	368	408	448	488	528	-	-	-	-	-	-
6	336	376	416	456	496	-	-	-	-	-	-	-	-
7	384	424	464	504	-	-	-	-	-	-	-	-	-
8	432	472	512	-	-	-	-	-	-	-	-	-	-
9	480	520	-	-	-	-	-	-	-	-	-	-	-
10	528	-	-	-	-	-	-	-	-	-	-	-	-

PVAS part numbers

PVAS part numbers according to length L2 [mm]

Length range mm [in]	Part number
20 - 48 [0.79 - 1.89]	11188219
49-60 [1.93- 2.36]	11188218
61 - 72 [2.40 - 2.83]	157B8000
73-84 [2.87 - 3.31]	11188217
85 - 96 [3.35 - 3.78]	157B8031
97 - 108 [3.82 - 4.25]	11188216
109- 120[4.29- 4.72]	157B8001
121 - 132 [4.76 - 5.20]	11188215
133- 144 [5.24 - 5.67]	157B8021
145 - 156[5.71 - 6.14]	11188214
157 - 168 [6.18 - 6.61]	157B8002

Ordering information

PVAS part numbers according to length L2 [mm] (continued)

Length range mm [in]	Part number
169- 180[6.65-7.09]	11188213
181- 192 [7.13- 7.56]	157B8022
193-204 [7.60 - 8-03]	11188212
205 - 216 [8.07 - 8.50]	157B8003
217 -228 [8.54 - 8.98]	11188211
229 - 240 [9.02 - 9.45]	157B8023
241 - 252 [9.49- 9.92]	11188210
253 - 264 [9.96 - 10.39]	157B8004
265 - 276 [10.43 - 10.87]	11188209
277 -288 [10.91 - 11.34]	157B8024
289 - 300[11.38 - 11.81]	11188208
301- 312 [11.85 - 12.28]	157B8005
313-324 [12.32-12.76]	11188207
325 - 336[12.80 - 13.23]	157B8025
337 - 348 [13.27 - 13.70]	11188206
349 - 360 [13.74 - 14.17]	157B8006
361-372 [14.21- 14.65]	11188205
373 - 384 [14.69- 15.12]	157B8026
385 - 396 [15.16 - 15.59]	11188204
397 - 408 [15.63- 16.06]	157B8007
409 - 420 [16.10 - 16.54]	11188203
421 - 432 [16.58 - 17.0 1]	157B8027
433 - 444 [17.05 - 17.48]	11188202
445 - 456 [17.52 - 17.95]	157B8008
457 -468 [17.99- 18.43]	11188201
469 - 480 [18.47 - 18.90]	157B8028
481 - 492 [18.94- 19.37]	11188200
493-504 [19.41- 19.84]	157B8009
505 - 516 [19.88-20.31]	11188199
517 - 528 [20.35 - 20.79]	157B8029

Ordering information

EVT assembly kit numbers (mechanical and electrical acting)

EVT assembly kit for various ECO 80 combinations consist of four tie rods, eight washers, eight nuts and O-ring. Use the guide and reference tables how to choose PVAS kit.

The tie rods are inserted through the entire length of the PVG valve stack. The nuts are tightened at the pump side and at the end plate.

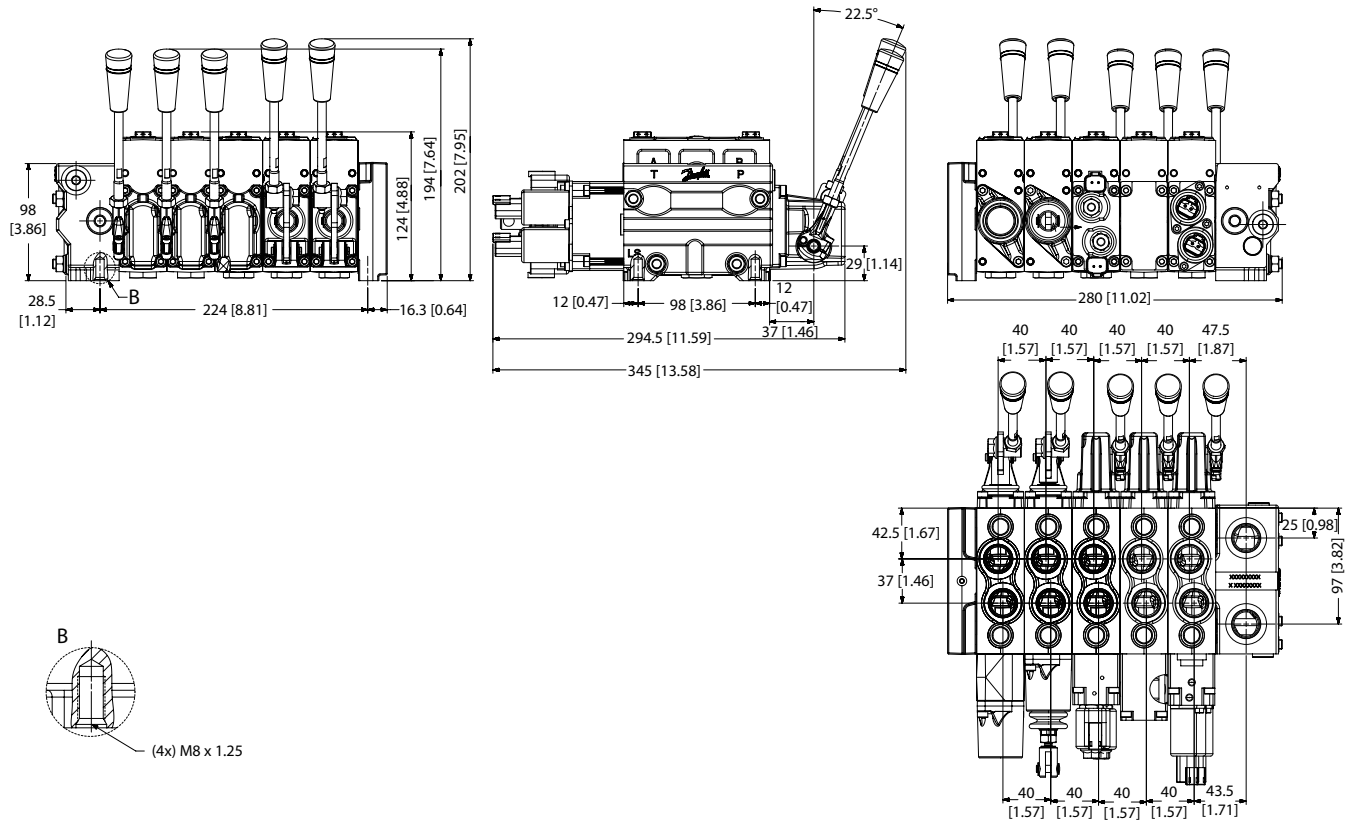
Part numbers

Number of EVB's	Part number
1	11173102
2	11173103
3	11173104
4	11173105
5	11173106
6	11173107
7	11173108
8	11173109
9	11173110
10	11173111
11	11173112
12	11173113

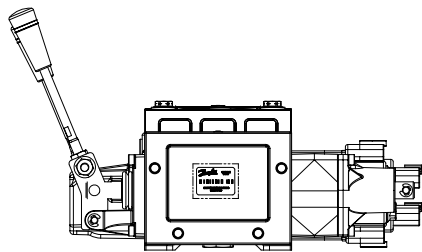
Technical Information ECO 80 7mm Directional Control Valve

ECO 80 7mm dimensions

Dimensions mm [in]



Label location



Number of EVBs	1	2	3	4	5	6	7	8	9	10	11	12
L1 mm [in]	65 [2.56]	105 [4.13]	145 [5.71]	185 [7.28]	225 [8.86]	265 [10.43]	305 [12.01]	345 [13.58]	385 [15.16]	425 [16.73]	465 [18.31]	505 [19.88]
L2 mm [in]	130 [5.12]	170 [6.69]	210 [8.27]	250 [9.84]	290 [11.42]	330 [12.99]	370 [14.57]	410 [16.14]	450 [17.72]	490 [19.29]	530 [20.87]	570 [22.44]

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- DCV directional control valves
- Electric converters
- Electric machines
- Electric motors
- Gear motors
- Gear pumps
- Hydraulic integrated circuits (HICs)
- Hydrostatic motors
- Hydrostatic pumps
- Orbital motors
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- PLUS+1® displays
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- PLUS+1® software
- PLUS+1® software services, support and training
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- PVG proportional valves
- Steering components and systems
- Telematics

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**Danfoss
Power Solutions (US) Company**
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

**Danfoss
Power Solutions GmbH & Co. OHG**
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

**Danfoss
Power Solutions ApS**
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

**Danfoss
Power Solutions Trading
(Shanghai) Co., Ltd.**
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 2080 6201

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