



**CHARACTERISTICS**

- THREE TYPES OF THREADING  
AVAILABLE: BSP, NPTF, SAE
- SMX: UP TO 500 BAR  
SMO: UP TO 400 BAR
- OIL AND GREASE FUNCTION
- CE AND ATEX MARKINGS
- BASES ALWAYS SUPPLIED WITH STANDARD SEALS AND MOUNTING SCREWS
- THE TWO OUTPUTS ARE COMBINED BY SUBSTITUTING THE ADAPTER.
- EXHAUST-AIR VALVES INCORPORATED IN BOTH SIDES OF THE BASE
- SAFE AND CONTROLLED LUBRICATION
- EASY AND FLEXIBLE ASSEMBLY WITH LOW MAINTENANCE COSTS
- POSSIBILITY OF REPLACING THE METERING ELEMENTS WITHOUT BLOCKING THE PIPEWORK

**APPLICATIONS**

- ANY OIL AND GREASE LUBRICATION SYSTEM

**SMX/SMO MODULAR PROGRESSIVE DIVIDERS**

The SMX/SMO modular dividers are capable of guaranteeing precise lubrication while maximising the efficiency of lubrication systems.

The divider consists of two main parts:

- **THE BASE** (consisting of a minimum of three elements)
- **THE METERING VALVES** (available with both a **single outlet** as well as a **double one**).

To maximize the performance of the plant, it is crucial to use **electrical monitoring elements** that detect malfunctioning or system blockage.

Thanks to its **modularity**, the system can be easily expanded and replacement of metering elements can occur without removing the pipework, thereby guaranteeing low maintenance costs. The modularity of the dividers furthermore allows you to bundle lubrication points according to system requirements.

The modular system consists of two main components: the base and the metering elements.

The modular progressive divider is available in two sizes:

SMO: Miniature (Mini)

SMX: Standard



**GENERAL CHARACTERISTICS FOR LUBRICANTS AND MAXIMUM OPERATING PRESSURE:**

	SMX	SMO
<b>OIL</b>	Mineral oil viscosity 32 ÷ 6000 cSt	Mineral oil viscosity 32 ÷ 6000 cSt
<b>GREASE</b>	EP type - without a thickener Viscosity between 000 ÷ NLGI 2	EP type - without a thickener Viscosity between 000 ÷ NLGI 2
<b>NUMBER OF STROKES/MINUTE</b>	Max. 500 for the dosing element without a sensor, oil viscosity max. 220 cSt For the dosing unit with a sensor, see section 1.2.8	Max. 300 for the dosing element without a sensor, oil viscosity max. 220 cSt For the dosing unit with a sensor, see section 1.2.8
<b>OPERATING PRESSURE</b>	Max 500 bar	Max 400 bar

*Note: the pressure is directly proportional to the number of strokes*

*The value of viscosity for oil and grease are always linked to the operating temperature*

**TECHNICAL INFORMATION**

VERSION	TYPE	OIL CST (*)	GREASE NLGI (*)	OIL 32 CST		GREASE NLGI 2		TEMP. °C (°F)	VITON O-RING
				MIN. PRESSURE BAR (PSI)	MAX PRESSURE BAR (PSI)	MIN. PRESSURE BAR (PSI)	MAX PRESSURE BAR (PSI)		
STANDARD	SMX 0641516 ÷ 0641825	68 ÷ 6000	000 ÷ 2	15 (220.5)	250 (3675)	20 (294)	400 (5880)	-25 ÷ +80 (-13 ÷ +176)	
	SMO 0641716 ÷ 0641747								
LOW PRESSURE	SMX 0641516L ÷ 0641825L	-	00 ÷ 2	10 (147)	150 (2205)	15 (220.5)	250 (3675)	-25 ÷ +100 (-13 ÷ +212)	
	SMO 0641716L ÷ 0641747L								
HIGH PRESSURE	SMX 0641516P ÷ 0641825P	32 ÷ 220	-	20 (294)	400 (5880)	25 (367.5)	400 (5880)	-15 ÷ +50 (5 ÷ +122)	X
NPT OUTLET	SMX 0641516U ÷ 0641825U	68 ÷ 6000	000 ÷ 2	15 (220.5)	250 (3675)	20 (294)	400 (5880)	-15 ÷ +80 (5 ÷ +176)	X

*(\*) The value of viscosity for oil and grease are always linked to the operating temperatures*



## THE BASES

THE BASE CONSISTS OF A MINIMUM OF **THREE ELEMENTS**.

INITIAL, INTERMEDIATE AND FINAL BASE

For assembling, it is essential to know the number of outlets required to lubricate the system in order to identify the number of useful elements.

The screws are not included; it is recommended that you buy the **BASE AND ELEMENT ASSEMBLY KIT** (part number **3140857** composed of no. 3 screws for the assembly of the base- no. 3 threaded grub screws - no. 2 screws for the elements)

If you do not have special requirements, it is possible to order assembled bases that are already mounted (see p. 3).

The elements can be assembled easily, without having to detach the pipework.

During assembly, pay **ATTENTION** to the O-rings situated on the side of the base.



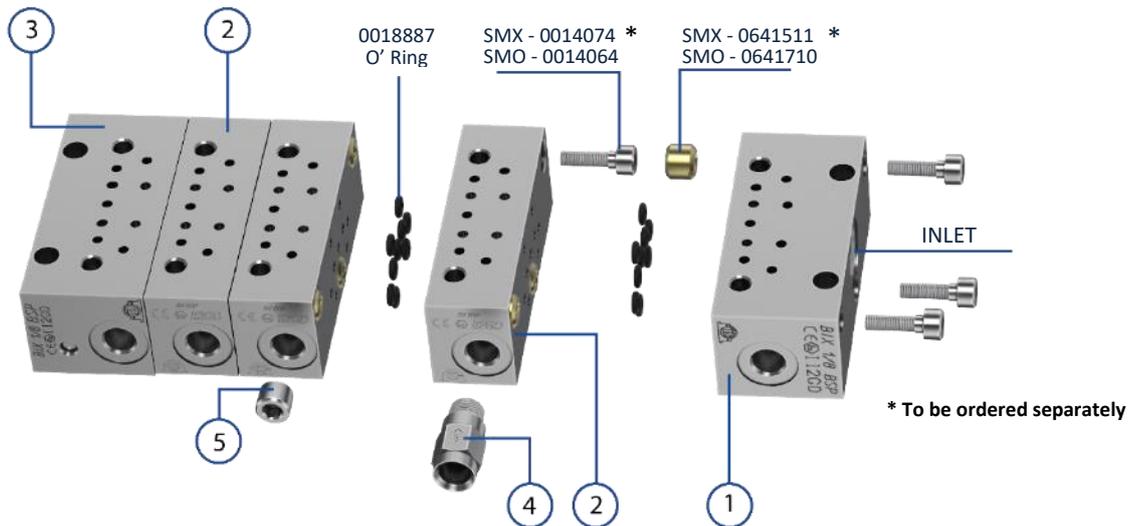
**1. INITIAL BASE**



**2. INTERMEDIATE BASE**



**3. END BASE**

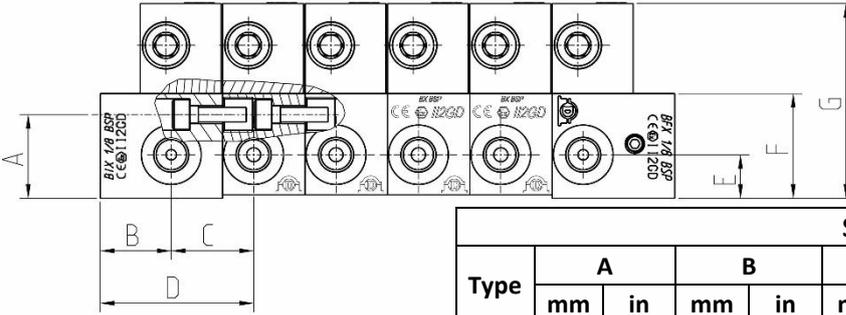


POSITION	DESCRIPTION	SMO		SMX			
		1/8 BSP	1/8 NPTF	1/4 BSP	1/4 BSP(1)	1/4 NPTF	7/16-20 UNF
	Inlet thread	1/8 BSP	1/8 NPTF	1/4 BSP	1/4 BSP(1)	1/4 NPTF	7/16-20 UNF
	Outlet thread	1/8 BSP	1/8 NPTF	1/8 BSP	1/4 BSP(1)	1/8 NPTF	7/16-20 UNF
<b>1</b>	Initial base	<b>0641711</b>	<b>0643562</b>	<b>0641512</b>	<b>0642800</b>	<b>0643541</b>	<b>0643800</b>
<b>2</b>	Intermediate base	<b>0641712</b>	<b>0643563</b>	<b>0641513</b>	<b>0642802</b>	<b>0643542</b>	<b>0643801</b>
<b>3</b>	End base	<b>0641713</b>	<b>0643564</b>	<b>0641515</b>	<b>0642804</b>	<b>0643561</b>	<b>0643802</b>
<b>4</b>	Check valve	<b>0092335</b>	<b>0641564</b>	<b>092335</b>	<b>0641564</b>	<b>0641564</b>	<b>0642029</b>
<b>5</b>	Plug	<b>3232098</b>	<b>3232095</b>	<b>3232098</b>	<b>3232095</b>	<b>3232095</b>	<b>0642031</b>

(1) Special versions only on request

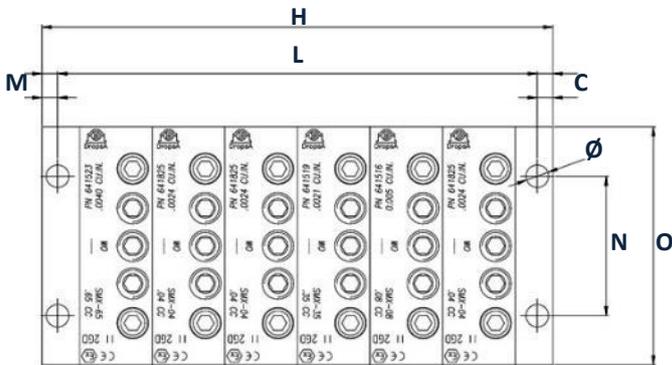


### DIMENSIONS



SMO - SMX DIMENSIONS														
Type	A		B		C		D		E		F		G	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
<b>SMO</b>	18.5	0.72	16	0.62	20.60	0.80	36.6	1.44	12.5	0.72	30	1.17	50	1.9
<b>SMX</b>	20	0.78	20.2	0.78	23.42	0.91	43.6	1.72	12.5	0.72	30	1.17	56	2.2

SMX DIMENSIONS 1/4 BSP outlet						
Type	B		D		E	
	mm	in.	mm	in.	mm	in.
<b>SMX</b>	19.3	0.76	42.72	1.68	11.5	0.45



DIMENSIONS SMO-SMX							
Type	M		N		O		Ø
	mm	in.	mm	in.	mm	in.	
<b>SMO</b>	4,2	0.16	42	1.63	68	2.6	6
<b>SMX</b>	5,0	2	44,45	1.73	76	2.9	7.2

No. of elements	SMX DIMENSIONS				SMO DIMENSIONS			
	B		A		B		A	
	Centre to centre distance of the fixing holes [mm]	Centre to centre distance of the fixing holes [inches]	Total length [mm]	Total length [inches]	Centre to centre distance of the fixing holes [mm]	Centre to centre distance of the fixing holes [inches]	Total length [mm]	Total length [inches]
<b>3</b>	83.22	3.28	93.02	3.66	72.4	2.85	80.4	3.17
<b>4</b>	106.64	4.2	116.44	4.58	93.2	3.67	101.2	3.98
<b>5</b>	130.06	5.12	139.86	5.51	114	4.49	122	4.8
<b>6</b>	153.48	6.04	163.28	6.43	134.8	5.31	142.8	5.62
<b>7</b>	176.9	6.96	186.7	7.35	155.6	6.13	163.6	6.44
<b>8</b>	200.31	7.89	210.11	8.27	176.4	6.95	184.4	7.26
<b>9</b>	223.73	8.81	233.53	9.19	197.2	7.76	205.2	8.08
<b>10</b>	247.15	9.73	256.95	10.12	218	8.58	226	8.9
<b>11</b>	270.57	10.65	280.37	11.04	238.8	9.4	246.8	9.72
<b>12</b>	293.99	11.57	303.79	11.96	259.6	10.22	267.6	10.54
<b>13</b>	317.41	12.5	327.21	12.88	280.4	11.04	288.4	11.35
<b>14</b>	340.83	13.42	350.63	13.8	301.2	11.86	309.2	12.17
<b>15</b>	364.25	14.34	374.05	14.73	322	12.68	330	12.99
<b>16</b>	387.67	15.26	397.47	15.65	342.8	13.5	350.8	13.81
<b>17</b>	411.09	16.18	420.89	16.57	363.6	14.32	371.6	14.63
<b>18</b>	434.5	17.11	444.3	17.49	384.4	15.13	392.4	15.45
<b>19</b>	457.92	18.03	467.72	18.41	405.2	15.95	413.2	16.27
<b>20</b>	481.34	18.95	491.14	19.34	426	16.77	434	17.09



## APPLICATION EXAMPLES

DIVIDER ELEMENT VERSION	TYPE OF DIVIDER ELEMENT	APPLICATION
STANDARD	SMO - SMX	Standard version ideal for the majority of oil and grease installation and Air/Oil lub. systems.
LOW PRESSURE-L	SMO - SMX	Metering elements designed for installations with lubricants (grease) with solid additive (e.g. graphite, copper or silicone). L version has a particular clearance between the piston and the metering element body which allows the passage of the thick particles which won't be possible with the standard version.
HIGH PRESSURE - P	SMX	Metering elements for high pressure oil installations where there could be high counter-pressure at the lubrication point (e.g. gas compression plants). Accurate coupling between the metering element body and the piston has been designed to reduce the risk of internal leakage.
NPT - U OUTLET	SMX	Metering elements with upper outlet in NPT.

### ASSEMBLED BASES

The assembled bases are supplied in a fully mounted state for easy ordering and installation by the customer.



SMO					SMX				
INLET/OUTLET THREAD			WEIGHT		INLET/OUTLET THREAD			WEIGHT	
N° elem	BSP	NPTF	Kg	Lb.	BSP	NPTF	SAE-UNF	Kg	Lb.
3	0641763	0643543	0.92	2.0	0641583	0643523	0642703	1.3	2.9
4	0641764	0643544	1.13	2.5	0641584	0643524	0642704	1.6	3.5
5	0641765	0643545	1.33	2.9	0641585	0643525	0642705	1.9	4.2
6	0641766	0643546	1.54	3.4	0641586	0643526	0642706	2.2	4.8
7	0641767	0643547	1.75	3.9	0641587	0643527	0642707	2.5	5.5
8	0641768	0643548	1.96	4.3	0641588	0643528	0642708	2.8	6.2
9	0641769	0643549	2.17	4.8	0641589	0643529	0642709	3.1	6.8
10	0641770	0643550	2.38	5.2	0641590	0643530	0642710	3.4	7.5
11	0641771	0643551	2.59	5.7	0641591	0643531	0642711	3.7	8.1
12	0641772	0643552	2.80	6.2	0641592	0643532	0642712	4.0	8.8
13	0641773	0643553	3.00	6.6	0641593	0643533	0642713	4.3	9.5
14	0641774	0643554	3.16	6.9	0641594	0643534	0642714	4.5	9.9
15	0641775	0643555	3.42	7.5	0641595	0643535	0642715	4.9	10.8
16	0641776	0643556	3.63	8.0	0641596	0643536	0642716	5.2	11.4
17	0641777	0643557	3.84	8.4	0641597	0643537	0642717	5.5	12.1
18	0641778	0643558	4.05	8.8	0641598	0643538	0642718	5.8	12.8
19	0641779	0643559	4.26	9.4	0641599	0643539	0642719	6.1	13.4
20	0641780	0643560	4.47	9.8	0641600	0643540	0642720	6.4	14.0

### METERING VALVES



A minimum of three valves are required to build an assembly and can extend up to an unlimited number of elements.

The valves are available either with single outlet well as a double outlet (SAE and NPT).

In order to form the assembly in the most suitable manner, it is necessary to know the number of outlets required, the flow rate of each outlet, and to include the UltraSensor monitoring device to verify proper disbursement.

The installation takes place using the two mounting screws (to be ordered separately).

It is always possible to replace the valve with a different model without disconnecting the pipes or opening the bases.

SMO DIVIDER ELEMENTS			
Flow rate for outlet		1 or 2 outlets	
CC.	CU. IN.	Symbol	Part number
0.04	0.0024	SMO 04	0641720
0,08	0.005	SMO 08	0641716
0,16	0.010	SMO 16	0641717
0.25	0.015	SMO 25	0641718

SMX DIVIDER ELEMENTS			
Flow rate for outlet		1 or 2 outlets	
CC.	CU. IN.	Symbol	Part number
0.04	0.0024	SMX 04	0641825
0,08	0.005	SMX 08	0641516
0.16	0.010	SMX 16	0641517
0.25	0.015	SMX 25	0641518
0.35	0.021	SMX 35	0641519
0.40	0.025	SMX 40	0641520
0.50	0.030	SMX 50	0641521
0.60	0.036	SMX 60	0641522
0.65	0.040	SMX 65	0641523



**BRIDGEVALVE**



Thanks to the bridge plates, it is possible to transfer the flow rate of one metering valve to the next one.

Must be sorted based on the output side you want to add. There are three types of divider bridges, which coincide with the outlet: right bridge, left bridge or right/left bridge

The side of the bridge and reported directly on the piece with an arrow, indicating the output connected to the next.

For mounting position the bridge over the base and using the two screws supplied with the bridge element for attaching everything.

**IMPORTANT:** plug the outlets corresponding to the arrows on the bridge elements.

SMO DIVIDER ELEMENT VERSION with flow rate to the subsequent element					
LEFT		LEFT/RIGHT		RIGHT	
acronym	PART NO.	acronym	PART NO.	acronym	PART NO.
SMO 04L	0641733	SMO 04LR	0641744	SMO 04R	0641738
SMO 08L	0641734	SMO 08LR	0641745	SMO 08R	0641739
SMO 16L	0641735	SMO 16LR	0641746	SMO 16R	0641740
SMO 25L	0641736	SMO 25LR	0641747	SMO 25R	0641741

SMX DIVIDER ELEMENT VERSION with flow rate to the subsequent element					
LEFT		LEFT/RIGHT		RIGHT	
acronym	PART NO.	acronym	PART NO.	acronym	PART NO.
SMX 04L	0641826	SMX 04LR	0641827	SMX 04R	0641828
SMX 08L	0641629	SMX 08LR	0641637	SMX 08R	0641621
SMX 16L	0641630	SMX 16LR	0641638	SMX 16R	0641622
SMX 25L	0641631	SMX 25LR	0641639	SMX 25R	0641623
SMX 35L	0641632	SMX 35LR	0641640	SMX 35R	0641624
SMX 40L	0641633	SMX 40LR	0641641	SMX 40R	0641625
SMX 50L	0641634	SMX 50LR	0641642	SMX 50R	0641626
SMX 60L	0641635	SMX 60LR	0641643	SMX 60R	0641627
SMX 65L	0641636	SMX 65LR	0641644	SMX 65R	0641628

**BYPASS ELEMENT**



The bypass element has the same dimensions as a divider element, but without an internal piston, therefore without a metering system.

Its function is to create a reserve position where you can install a metering valve to increase the number of outlets.

The installation takes place using the two mounting screws (to be ordered separately.)

The bypass element can be mounted on a dosing group where there are at least three effective metering elements present.

**IMPORTANT:** After installation, remember to plug the outlets.

DESCRIPTION	SMO	SMX
BY-PASS VALVE	0641714	0641514

**ASSEMBLY**

The assembly and of the metering elements is very simple:

- Position the valve on its base.
- Insert fastening screws.
- Tighten them.

In case there is a bridge position it between the base and the valve, remember to attach everything with the mounting screws supplied with the bridge element.



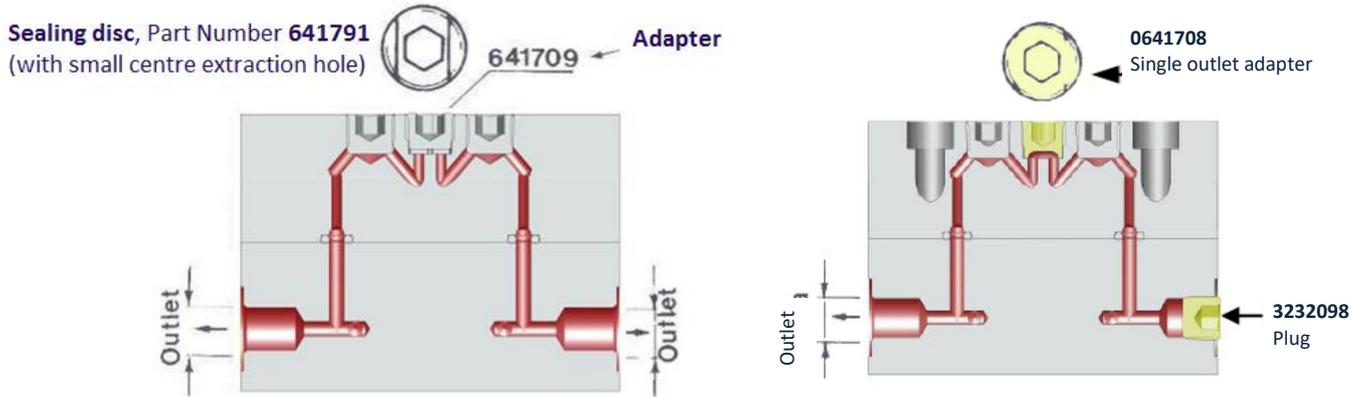
**\* FASTENING SCREWS TO BE ORDERED SEPARATELY**

0014077 SMO

0014242 SMX

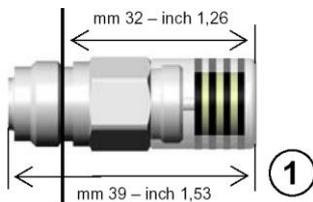
**DEVICE TO MERGE OR TO SEPARATE OUTLETS**

It is possible to add the two flow rates of a single element by substituting the adapter, Part Number 641709, with the adapter, Part Number 641708, as illustrated in the drawing below. When the two outlets are connected, remember to close off the one that is not being used with a plug. The tightening torque of these adapters to ensure the seal and dismantling should be 0.8-1 Kg m (8-10 Nm). When the two outlets are connected, remember to close off the one that you do not want to use with a plug.



**MONITORING DEVICES**

**VISUAL INDICATOR**



This sensor is designed to monitor the proper functioning of a progressive system without allowing the lubricant to escape outside of the operating chamber.

The indicator allows for the course of the SMX metering piston element to be checked. The electronic logic that characterises the sensor allows for a visual or acoustic alarm to be transmitted or if necessary, it shuts down the system.

<b>VISUAL INDICATOR FOR SMX 08 +SMX 65</b>
<b>1655200</b>

**OVERPRESSURE INDICATOR**



These indicators are generally used to control the overpressure on the primary and secondary lines.

If an excessive increase in pressure is detected, the indicator pin projects out, and stays in place until the release lever is lowered manually.

It is recommended to find out the reason and the location of the fault before lowering the lever.

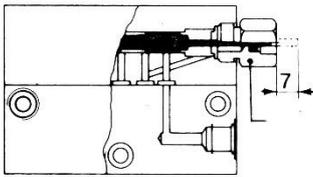
PRESSURE INDICATOR WITH ROD		
PRESSURE		PART NUMBER
psi	Bar	1/8 BSP
300	20	3290019
450	30	3290006
750	50	3290007
1500	100	3290008
2200	150	3290009
2900	200	3290010
3600	250	3290011

PRESSURE INDICATOR WITH MEMBRANE		
PRESSURE		PART NUMBER
psi	Bar	1/8 BSP
450	30	3290012
750	50	3290013
1100	75	3290014
1500	100	3290015
2200	150	3290016
2900	200	3290017

PRESSURE INDICATOR WITH MEMORY		
PRESSURE		PART NUMBER
psi	Bar	1/8 BSP
450	30	3290000
750	50	3290001
1100	75	3290022
1500	100	3290002
2200	150	3290003
2900	200	3290004
3600	250	3290005

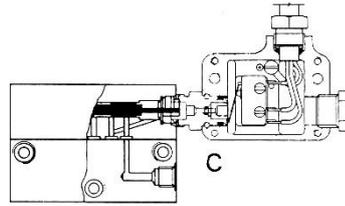


**MICRO-SWITCH**



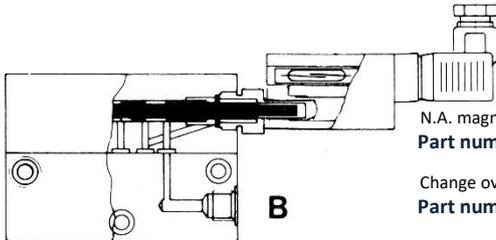
**A**

Adapter only:  
SMX 35 ÷ 65  
Part number 6400092  
SMX 04 ÷ 25 or SMO  
Part number 640599



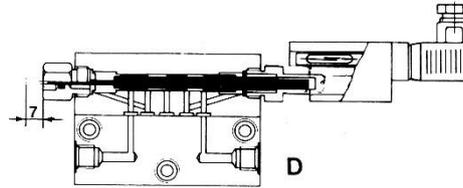
**C**

Only MICRO-CONTACT  
For SMX 35 ÷ 65  
Part number 1655133  
For SMX 04 ÷ 25 and SMO  
Part number 1655134



**B**

N.A. magnet control only  
Part number 1655059  
Change over control only  
Part number 1655124



**D**

	DELIVERY CC. CU. INS.	A	B		C	D		
		DISTRIBUTOR WITH INDICATING PIN "C"	DISTRIBUTOR WITH N.O. REED SWITCH "CC"	DISTRIBUTOR COMPLETE WITH CHANGEOVER REED SWITCH "GX"	DISTRIBUTOR WITH MICRO SWITCH "CT"	DISTRIBUTOR WITH PIN AND N.O. REED SWITCH "GC"	DISTRIBUTOR WITH PIN AND CHANGE OVER REED SWITCH "GXC"	
THE PART NUMBERS REFER TO THE DIVIDER ELEMENTS (8)	SMX	.04 .0024	0641829	0641833	0641972	0641837	-	-
		.08 .005	0641830	0641834	0641973	0641838	-	-
		.16 .010	0641831	0641835	0641974	0641839	-	-
		.25 .015	0641832	0641836	0641975	0641840	-	-
		.35 .021	0641695	0641569	0641976	0641820	0641690	0641493
		.40 .025	0641696	0641570	0641977	0641821	0641691	0641494
		.50 .030	0641697	0641571	0641978	0641822	0641692	0641495
		.60 .036	0641698	0641572	0641979	0641823	0641693	0641496
	SMO	.04 .0024	0641861	0641786	0641896	0641867	-	-
		.08 .005	0641862	0641787	0641897	0641868	-	-
		.16 .010	0641863	0641788	0641898	0641869	-	-
		.25 .015	0641761	0641811	0641899	0641815	0641813	0641568

**UltraSensor 2**



UltraSensor 2 was designed to replace systems with inductive proximity sensors, mechanical micro-switches, and the magnetic contacts that monitor the movement of the Pistons inside the divider elements of progressive systems.

The sensor is a screw-on accessory (laterally to the divider), without needing to make any modifications to the divider.

This patented technology allows you to check the variations in magnetic flow when the piston reaches the detection zone thanks to a Hall-Effect sensor.

There are no moving parts providing for a complete absence of wear.

The device is equipped with two LEDs:

- 1. MONITORING LED (ORANGE):** allows you to see the output signal. The LED signal indicates proper operation of the sensor. The LED is lit when the piston enters the detection zone and stays off when it is far away.
- 2. DIAGNOSTICS LED (GREEN):** When switched on, the number of pulses indicates the magnetic flux. The number of pulses can vary from 0 to 10; When the LED blinks five times (number of standard pulses), this indicates that the device is working properly. The diagnostic system makes it possible to verify correct magnetic field readings.

ULTRASENSOR (ELECTRIC)		
DESCRIPTION	SMX	SMO
Ultrasensor, stainless steel, AISI 316	1655340	1655342
Ultrasensor, nickel-plated brass	1655305	1655308



ACCESSORIES	SMX	SMO
Ultrasensor connector	0039999	
Sealing disc (with central extraction hole)	0641709	
Check valve, outlet	0092335	
M 1/4 NPTF - F 1/4 BSP reducer fitting	3077166	
M 1/8 NPTF - F 1/8 BSP reducer fitting	3077090	
M 1/4 BSP - F 1/4 NPTF reducer fitting	3077059	
M 1/8 BSP - F 1/8 NPTF reducer fitting	3077075	
Screws for assembling the base	0014074*	0014064*
Threaded grub screws	641511*	641710*
Screws for assembling the elements	0014242*	0014077*
Single outlet adapter	0641708	
ELEMENT AND BASE ASSEMBLY KIT (No. 3 screws for the assembly of the base- no. 3 threaded grub screws - no. 2 screws for the elements - no. 1 single outlet adapter)	3140770	3140769

\* Order separately - (sold in 500 pc. boxes or can be purchased in as multiple individual pieces by adding "-1" to the part number)

**ORDER INFORMATION - EXAMPLE ORDER**

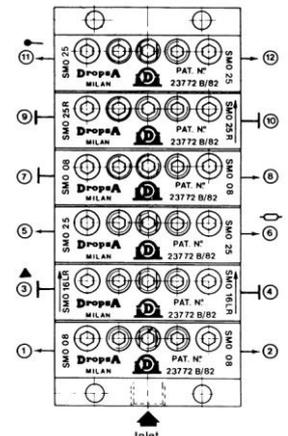
**SMO – 6 (O8 – 16LR – 25CC – 08D – 25R – 25C)**

**Attention:** To determine the outlets, take note that the assembly is seen vertically and the outlets are numbered sequentially starting from the top (inlet) from left to right.

A letter, a number or another letter is stamped on each divider element to indicate: series, 2) capacity for each cycle, 3) outlet.

The elements in the image are from the SMO series that have the following main characteristics:

- 1st input element: **SMO 08** with 2 outlets with a flow rate of 0.08 cm<sup>3</sup>/min each;
- The 2nd element is the **SMO 16 LR** which signifies a double right and left bridge for transfer to the subsequent element +0.16 cm<sup>3</sup>/min flow rate for each outlet;
- The 3rd element is the **SMO 25 CC** with two outlets with a flow rate of 0.25 cm<sup>3</sup>/min and a reed switch NO on the right (outlet 6).



**HOW TO ORDER THE ASSEMBLY**

