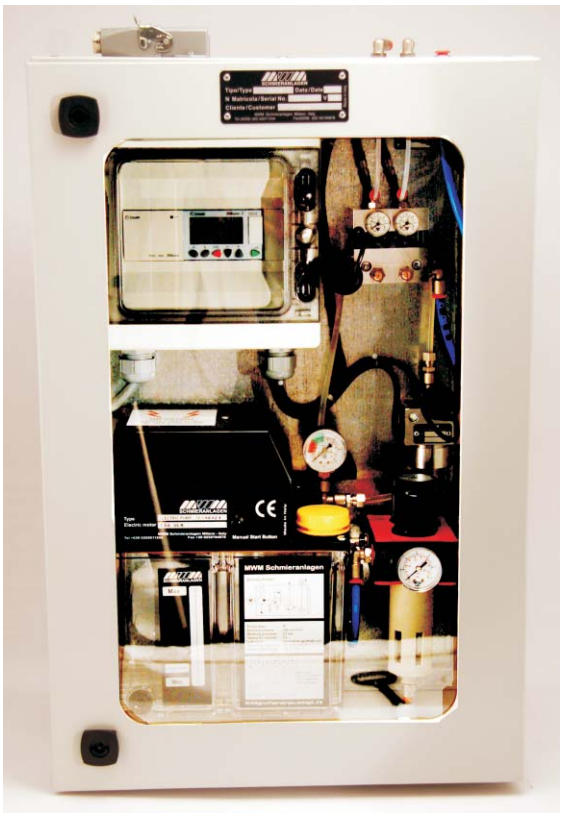

Air-oil lubrication unit
Series ZX
MQL System (Minimal Quantity Lubrication)

- **Preassembled *MQL* unit ready for use.**
- **Delivery flux monitoring by optical sensor. *(Patent pending).***
- **Air flow rate adjustable for each line.**
- **Minimum lubricant level electric control.**
- **Filtration: air 5 µm, oil 3 µm (optional).**
- **Equipped with PLC unit for cycle programming and lubrication control.**
- **Available with metallic box suitable for IP 54 protection.**

Application:
Minimal quantity lubrication for high speed bearings, for example on high frequency spindles, high speed gears, linear guides, ball circulation guides for machine tools, etc.
For all applications were pressured air is required to avoid dust, water and gas penetration.
All machine moving parts such as chains.
No pollution, no fog caused by lubrication (with low air delivery pressure).

Technical data:

Working temperature	0 ÷ +50 [°C]
Oil viscosity at 40°C:	50÷100 cSt
Filtering:	
oil filter element:	3 micron
air filter element:	5 micron
External dimensions: (HxLXP):	
version from 1 to 4 points: without box	490 x 350 [mm]
with box F 930000	500 x 400 x 200 [mm]
version from 5 to 10 points: without box	590 x 350 [mm]
with box F 932000	600 x 400 x 250 [mm]
special version : without box	690 x 450 [mm]
with box F 935000	700 x 500 x 250 [mm]
Protection (with box):	IP 54
Acoustic Emission Leq(A):	< 70 [dB]
PLC feeding voltage:	24 [VDC]

Electric pump equipped model

Pump motor voltage:	110/220 single-phase [VAC]
	24 [VDC]
	380/420 three-phase [VAC]
Max current: with motor at 24 VDC	6A
with single-phase / three-phase	2A

Pneumatic pump equipped model

Min air pressure:	4 bar
Max air pressure:	6 bar

- Subject to changes without notice -

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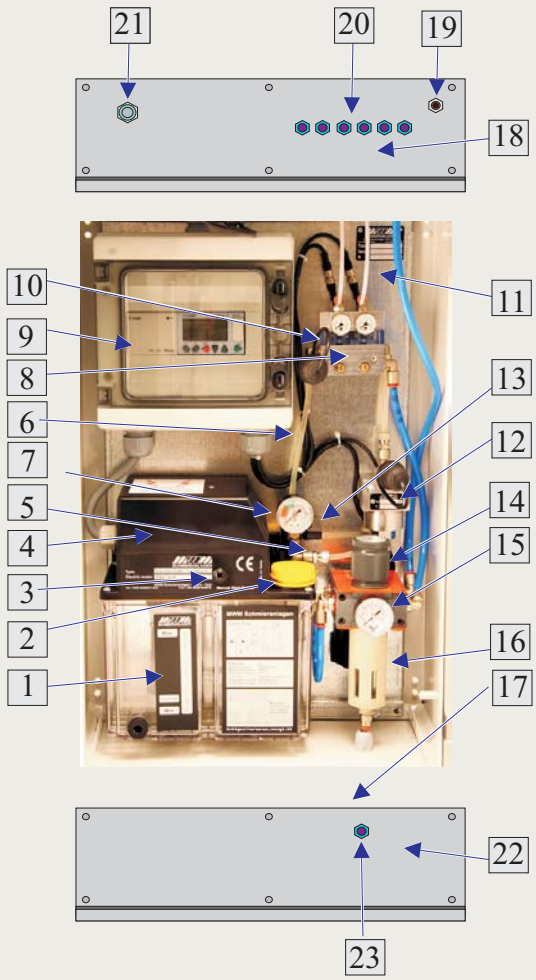
ZX oil+air unit basic components



1 Oil tank
2 Filler cap
3 Motor pump's manual starting switch
4 Pump unit
5 Oil delivery line
6 Oil back line
7 Oil pressure gauge
8 Air+oil mixer
9 Programmable unit with protective box
10 Optical sensors (internal version)
11 Assembly steel plate
12 Oil filter
13 Manual valve for air de-aeration (normally closed)
14 Air pressure reduction to the mixer
15 Air reduced pressure gauge
16 Air filter 5 [µm]
17 Steel sheet housing (by request)
18 Upper cover
19 Air feeding
20 Air+oil outlets
21 Electrical connections
22 Bottom cover
23 Condense off line

Supply conditions:

All components are installed on an assembly plate and are supplied as a complete system.
Each unit is provided with instruction manual.

The above figure shows the unit as standard version. Further optional components may be integrated. These components are not covered by this leaflet, please read the corresponding technical leaflets.
The lubrication unit can be assembled in different executions (see order coding at page 5).
Each unit is provided with CQ label which certifies the quality test.

The lubrication unit should be used as component, so it is not provided with energy isolation devices. A solenoid valve , placed on the air feeding line, and an electric general switch are available by request.

For further information concerning components have a look at the specific technical leaflets, ask for full catalogue or check on the web site: www.mql.it.

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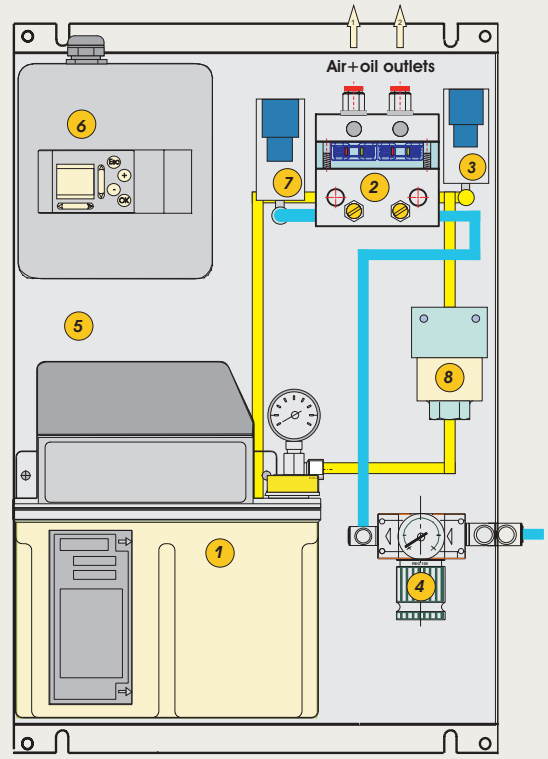
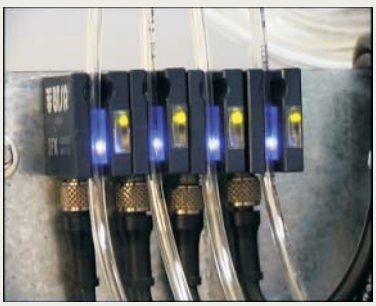


ZX unit, 2 lubrication points,without box

IFX inside MVF-A



IFX outside of the MVL-F

Working description:

The ZX units produce the air+oil mixture dosing small and precise amount of oil per each cycle in a continuous air flow.

ZX lubrication unit has (in this example) 2 outlets and a dedicated PLC control unit (6) for programming.
The pumping system has a 3 liters capacity reservoir and a single-phase motor.

The unit is connected to the compressed air network and to the electric power. The oil volumes fed to the lubrication points depend on the dosing elements and on cycle frequency.

Oil in pressure passes through the filter (8) to reach the oil mixer (2). The right amount of oil is distributed by dosing elements and mixed with air, the flow rate can be adjusted by a screw placed on each outlet.

The air+oil mixture is controlled by an optical sensor , which verifies also the minimum flow rate level. The sensor is mounted inside for the MVF-A mixer and outside for the MVL-F mixer.

The PLC checks also the pump (1) level switch signal as well as the air pressure switches (7) and oil pressure switch (3), available on demand.
The pump driving is managed by PLC so that the amount of oil is related to the pump working time.

Air+Oil mixture detector - Optical sensor IFX

Mixer MVF-A

The optical sensors IFX is mounted inside the mixer; the lubricant control take place very close to the air+oil mixing point, having a quick and reliable signal coming out of the system. The sensor is equipped with a light emitting diode which projects a beam on an electronic receiver. Any image variation in the moving air+oil mixture under control is detected and processed according to a patented and advanced control technology. The pre-set value which refers to a standard-normal run causes the green LED to flash.

In case of a system stop or a lack of lubricant, an alarm output is provided and the corresponding red LED goes out.

Mixer MVL-F

The monitoring device IFX optical sensor is installed on a transparent pipe outside the mixer to detect the air+oil mixture flow. It is available for the Ø 4 or the Ø 6 tube to fit your application and it is programmable with different parameters.

For further information please refer to the technical leaflet: IFX, MVF-A and MVL-F.

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Order coding:

Air-oil minimal lubrication unit: ZX (X)(X)(X)(X)(X)(X)(X)(X)(X)

Outlets No.	Pump driving	Pump reservoir capacity	Oil filter	Pressure control	Electrical connections	Air treatment group	Steel sheet housing	Supply voltage
(1) ⋮ (12)	(0) Pneumatic pump drive (1) Like 1 with timer (2) Like 1 with PLC (3) Gear pump 1 phase motor (4) Like 3 with timer (5) Like 3 with PLC	(1) Plastic 3 liter (2) Plastic 6 liter	(0) Without (1) with 3 µ	(0) Without (A) Pr.switch NO 0.1÷1 bar type N2311120 (E) Pr.switch NO 1÷5 bar type N2311121 (F) Pr.switch NO 1÷10 bar type N2311122 (G) Pr.switch main oil line NO 20÷50 bar type N2310124 In every oil-air lines (M) Pressure block gauge +p.switch type N21 (N) Pressure sensor with display Typ N200 (P) Pressure gauge on aluminium support	(0) Without terminal board (1) Terminal board with protective housing (2) 2 plug connectors 1 supply voltage 2 alarm output (3) Circular multipolar plug connector (4) Terminal board with protective housing and 5 m cable	(0) Without (A) Series 100 press.reg.filter type N640116 (B) Series 100 pressure reg. type N640117 (C) like (A) solenoid valve type N640126 (D) Series200 press.reg.filter type N640216 (E) like (A) with solenoid valv. type N640135 (G) like (E) with dep. filter type N640136 (M) Series mini press.reg.filter. (N) Like M + solenoid valve type N640055 (F) With FR Festo type N620300	(0) without (1) with	(0) 24 VDC (1) 220/240 VAC 50/60 Hz inclusive feeder 240VAC/24VDC (2) 110/115 VAC 50/60 Hz inclusive feeder 110VAC/24VDC
(6) Gear pump 3 phase motor		(1) Plastic 3 liter (2) Plastic 6 liter (3) Steel sheet 8 liter (4) Steel sheet 12 liter						(3) 220-240/ 380-420 VAC 50-60 Hz without PLC

→ with air-oil mixer type:

(X)(X) – (X)/(X)···/(X)
1 2 ···· N

Mixer type	Ø tube for air-oil outlets	Manometer for A/O line	Metering element [mm³]
MVF-A B4	(1) Ø 4 [mm]	(0) without (1) with	(0) without (1) 10 (2) 20 (3) 30
MVL-F B7	(2) Ø 6 [mm]	(0) without	(0) without (2) 22 (3) 34 (4) 57 (5) 110 (6) 170 (7) 230

Check functions in ZX air+oil unit:

- IFX Optical Sensor for each outlet
- Level switch oil tank
- Main air press. switch (by request)
- Main oil press. switch (by request)
- Manometer on the A/O outlets (for MVF-A)

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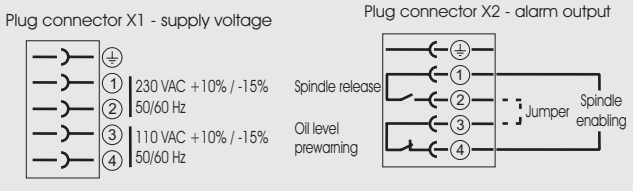
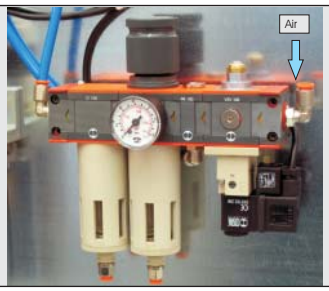
	Accessories :	Order coding
	**Pressure control:** Pressure sensor with display Typ N200 are provided to monitor air pressure in air+oil pipe outlets.	**"N"**
 	**Electrical Connections:** Plug connectors supply voltage and alarm output. All electrical connections are gathered in two plug connectors X1, X2. Connect supply voltage (230 VAC) to clamps 1 and 2, or (110 VAC) to clamps 3 and 4 on plug connector X1. On plug connector X2 to clamps 1 and 2 is arranged a spindle release contact, closing during correct functioning. The user can act on this contact to stop the spindle or the whole system in which the lubrication unit is incorporated. Oil level to clamps 3 and 4.	**"2"**
	Circular multipolar plug connector. Connect supply voltage (24VDC) to clamps "A" and "B". To clamps "C" and "D" is arranged a fault signal contact, closing during correct functioning.	**"3"**
	Multipolar plug connector, 15 poles, 8 mt. Connected on the plastic housing for the terminal board	**"4"**
	**Air Treatment group:** Series 100 with pressure regulator, gauge, filter 5 micron, fine filter 0,01 micron, and section valve.	**"G"**

For further information concerning accessories have a look at the specific technical leaflets.

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