



# Compact Units for Oil

Group MKU – 0.1, 0.2 or 0.5 l/min



These MKU compact units were developed to supply intermittently operated single-line central lubrication systems with lubricant. The basic model contains a gear pump with drive motor as well as the set of valves required for pressure relief and limitation (safety valve). The lubricant reservoir material is metal or plastic.

The units are controlled depending on their design

- by hand (unit with a pushbutton DK)
- by an external control system
- by a built-in electronic control and monitoring unit, timer or counter with adjustable interval and monitoring time



- by a built-in electronic control unit with adjustable interval time and fixed pump running time.

The control and monitoring unit is either a timer for time-dependent control or a counter for load-dependent control.

Special features:

- Preliminary lubrication (lubrication after the supply voltage is turned on)
- Pump delay time
- Pressure dependent cut-off
- Monitoring of pressure build-up
- Monitoring of pump running time



Possible monitoring elements:

- Pressure switch (DS) monitors the automatic pressure build-up
- Level indicator (WS)
- Pressure gauge (MA) displays the pressure response in the main line
- Monitoring contact (d2) turns off machine if pressure fails to build up
- Indicator light, green (SL1) shows that pump is running
- Indicator light, red (SL2) indicates a fault if pressure fails to build up or if there is a low level of lubricant in the reservoir (only with built-in level indicator)

# Technical data

### Gear pump unit

Flow rate at 50Hz: . . . . . 0.1, 0.2 or 0.5 l/min  
 Flow rate at 60Hz: . . . . . 0.12, 0.24 or 0.6 l/min  
*in relation to a service viscosity of 140 mm<sup>2</sup>/s, at a back pressure of p = 5 bar*

Operating pressure . . . . . 30 <sup>+1</sup>/<sub>-2</sub> bars  
*corresponds to actual value of built-in safety valve*  
 Operating temperature . . . . . +10 to +40 °C

Medium . . . . . oil on a petroleum basis  
 or synthetic basis  
 compatible with . . . . . plastics, NBR elastomers,  
 copper, copper alloys

Service viscosity  
 MKU1 units: . . . . . 20 - 750 mm<sup>2</sup>/s  
 MKU2, MKU5 units: . . . . . 20 - 1500 mm<sup>2</sup>/s

Reservoir capacity . . . . . nominal 1.8, 3 or 6 l  
 Reservoir material . . . . . plastic or metal  
 Type of enclosure . . . . . IP 54  
 Frequency / voltage . . . . . 50 / 60 Hz, 115 V AC or  
 50 / 60 Hz, 230 V AC  
*please indicate when ordering*

### Motor with built-in thermostatic switch

Mode of operation . . . . . S3, 20 % (1.25 to 25 min)  
 duty cycle <sup>1)</sup>  
 Power consumption approx. . . . . 50 Hz: 115 W; 60 Hz: 140 W  
 Speed . . . . . 50 Hz: 2700 rpm;  
 60 Hz: 3300 rpm

### Level indicator

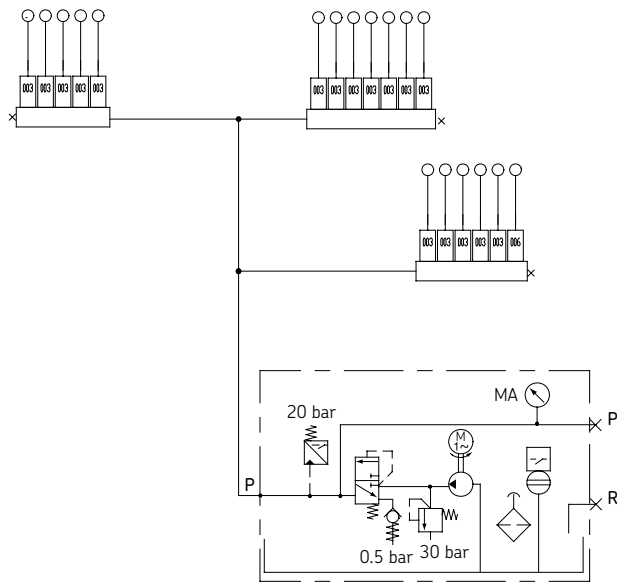
Function . . . . . opens in event of low lubricant  
 Max. switching voltage . . . . . 42 V AC  
 Max. switching current . . . . . 0.7 A  
 (ohmic load)  
 Max. contact rating . . . . . 50 VA <sup>2)</sup>

### Pressure switch

Type of contacts . . . . . closes when pressure builds up  
 Max. switching voltage . . . . . 42 V AC  
 Max. switching current . . . . . 2.5 A  
 (ohmic load)  
 Max. contact rating . . . . . 30 VA <sup>2)</sup>  
 Switching pressure . . . . . 20 bars

- 1) The 20 % duty cycle is the ratio of the pump running time to the subsequent idle time.  
 Example: 1 minute of pump running time requires at least 5 minutes of idle time.  
 The maximum permissible pump running time amounts to 3 minutes.  
 That results in a necessary idle time of 15 minutes.
- 2) Take appropriate measures to protect contacts when switching inductive loads.

### Anwendungsbeispiel: Universalfräsmaschine



### Notice!

Not all lubricants are suitable for central lubrication systems. The lubricant selected by the user should be approved by the Willy Vogel AG.

All equipment may only be installed and/or assembled by qualified personnel. Observe existing safety regulations.

See operating instruction 951-130-172.

## Units overview

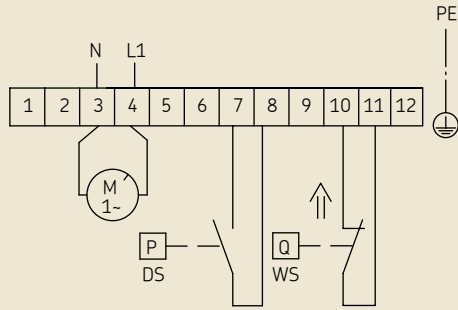
| Order No.      | Delivery rate<br>[l/min] | Reservoir capacity<br>[l] | Reservoir material<br>(*) | Control<br>manual/<br>external | Components |         |         |             | Hydraulic layout | Wiring diagram | Drawing |   |
|----------------|--------------------------|---------------------------|---------------------------|--------------------------------|------------|---------|---------|-------------|------------------|----------------|---------|---|
|                |                          |                           |                           |                                | IG12       | IG38-30 | IZ38-30 | DK DS WS MA |                  |                |         |   |
| MKU1-K2-20000  | 0.1                      | 1.8                       | K                         | Extern                         |            |         |         |             |                  | 1              | 1       | 1 |
| MKU1-K2-20003  | 0.1                      | 1.8                       | K                         | Extern                         |            |         |         |             | •                | 1              | 1       | 1 |
| MKU1-KW2-20000 | 0.1                      | 1.8                       | K                         | Extern                         |            |         |         |             | •                | 1              | 1       | 1 |
| MKU1-KW2-20001 | 0.1                      | 1.8                       | K                         | Extern                         |            |         |         |             | • •              | 1              | 1       | 1 |
| MKU1-KW2-20003 | 0.1                      | 1.8                       | K                         | Extern                         |            |         |         |             | • •              | 1              | 1       | 1 |
| MKU1-KW2-20004 | 0.1                      | 1.8                       | K                         | Extern                         |            |         |         |             | • • •            | 1              | 1       | 1 |
| MKU2-K3-20000  | 0.2                      | 3                         | K                         | •                              |            |         |         |             | • •              | 2              | 2       | 2 |
| MKU2-K3-22005  | 0.2                      | 3                         | K                         |                                |            | •       |         |             | • •              | 2              | 3       | 2 |
| MKU5-K3-22005  | 0.5                      | 3                         | K                         |                                |            | •       |         |             | • • •            | 2              | 3       | 2 |
| MKU2-KW3-20001 | 0.2                      | 3                         | K                         | •                              |            |         |         |             | • • •            | 2              | 2       | 2 |
| MKU2-KW3-20003 | 0.2                      | 3                         | K                         | •                              |            |         |         |             | • • • •          | 2              | 2       | 2 |
| MKU2-KW3-20004 | 0.2                      | 3                         | K                         | •                              |            |         |         |             | • • • •          | 2              | 2       | 2 |
| MKU2-KW3-20005 | 0.2                      | 3                         | K                         | •                              |            |         |         |             | • •              | 2              | 2       | 2 |
| MKU2-KW3-21003 | 0.2                      | 3                         | K                         |                                |            | •       |         |             | • • • •          | 2              | 4       | 2 |
| MKU2-KW3-21005 | 0.2                      | 3                         | K                         |                                |            | •       |         |             | • •              | 2              | 4       | 2 |
| MKU2-KW3-22001 | 0.2                      | 3                         | K                         |                                |            | •       |         |             | • • •            | 2              | 3       | 2 |
| MKU2-KW3-22003 | 0.2                      | 3                         | K                         |                                |            | •       |         |             | • • • •          | 2              | 3       | 2 |
| MKU2-KW3-22011 | 0.2                      | 3                         | K                         |                                |            |         | •       |             | • • •            | 2              | 3       | 2 |
| MKU2-KW3-22013 | 0.2                      | 3                         | K                         |                                |            |         | •       |             | • • • •          | 2              | 3       | 2 |
| MKU5-KW3-20001 | 0.5                      | 3                         | K                         | •                              |            |         |         |             | • • •            | 2              | 2       | 2 |
| MKU5-KW3-20003 | 0.5                      | 3                         | K                         | •                              |            |         |         |             | • • • •          | 2              | 2       | 2 |
| MKU5-KW3-22003 | 0.5                      | 3                         | K                         |                                |            | •       |         |             | • • • •          | 2              | 3       | 2 |
| MKU2-KW6-20001 | 0.2                      | 6                         | K                         | •                              |            |         |         |             | • • •            | 2              | 2       | 3 |
| MKU2-KW6-20003 | 0.2                      | 6                         | K                         | •                              |            |         |         |             | • • • •          | 2              | 2       | 3 |
| MKU2-KW6-22003 | 0.2                      | 6                         | K                         |                                |            | •       |         |             | • • • •          | 2              | 3       | 3 |
| MKU5-K6-22005  | 0.5                      | 6                         | K                         |                                |            | •       |         |             | • •              | 2              | 3       | 3 |
| MKU5-KW6-20001 | 0.5                      | 6                         | K                         | •                              |            |         |         |             | • • •            | 2              | 2       | 3 |
| MKU5-KW6-22001 | 0.5                      | 6                         | K                         |                                |            | •       |         |             | • • •            | 2              | 3       | 3 |
| MKU5-KW6-22003 | 0.5                      | 6                         | K                         |                                |            | •       |         |             | • • • •          | 2              | 3       | 3 |
| MKU2-BW3-20001 | 0.2                      | 3                         | B                         | •                              |            |         |         |             | • • •            | 2              | 2       | 4 |
| MKU2-BW3-20003 | 0.2                      | 3                         | B                         | •                              |            |         |         |             | • • • •          | 2              | 2       | 4 |
| MKU2-BW3-20005 | 0.2                      | 3                         | B                         | •                              |            |         |         |             | • •              | 2              | 2       | 4 |
| MKU2-BW3-21003 | 0.2                      | 3                         | B                         |                                |            | •       |         |             | • • • •          | 2              | 4       | 4 |
| MKU2-BW3-22001 | 0.2                      | 3                         | B                         |                                |            | •       |         |             | • • •            | 2              | 3       | 4 |
| MKU2-BW3-22003 | 0.2                      | 3                         | B                         |                                |            | •       |         |             | • • • •          | 2              | 3       | 4 |
| MKU2-BW3-22011 | 0.2                      | 3                         | B                         |                                |            |         | •       |             | • • •            | 2              | 3       | 4 |
| MKU2-BW3-22013 | 0.2                      | 3                         | B                         |                                |            |         | •       |             | • • • •          | 2              | 3       | 4 |
| MKU5-BW3-21003 | 0.5                      | 3                         | B                         |                                |            | •       |         |             | • • • •          | 2              | 4       | 4 |

\*) Reservoir material: **K** = plastic, **B** = metal• = components contained in the unit. **DK** = pushbutton / **DS** = pressure switch / **WS** = level indicator / **MA** = pressure gauge





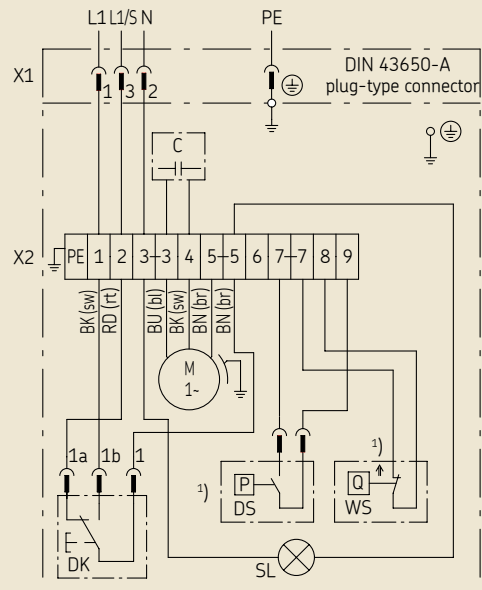
Wiring diagram 1



Legend (wiring diagrams 1-4)

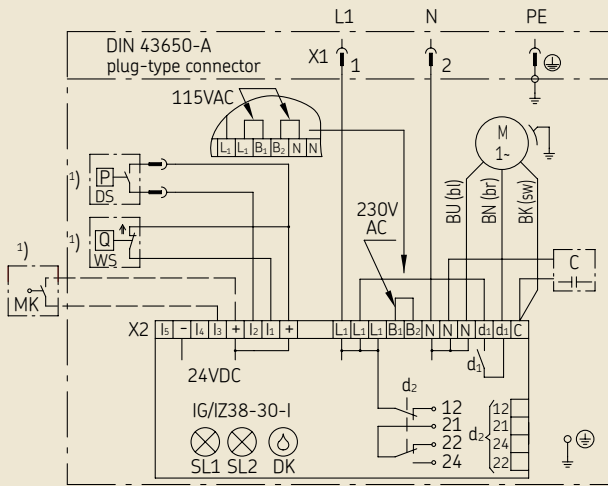
- L1 / N . . . . . terminal for operating voltage
- DK . . . . . pushbutton for intermediate lubrication
- DS . . . . . pressure switch
- WS . . . . . level indicator,  
contact illustration: full reservoir
- M . . . . . pump motor
- C . . . . . capacitor
- SL1 . . . . . indicator light (green) for "PUMP ON"
- SL2 . . . . . indicator light (red) for "FAULT"

Wiring diagram 2



1) optional

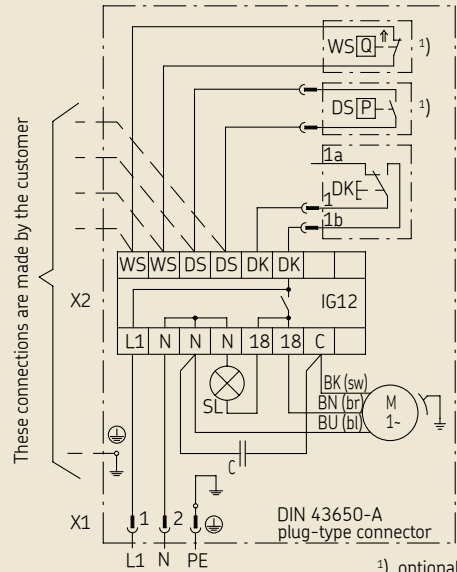
Wiring diagram 3



1) optional  
MK with counter mode only

d<sub>2</sub>:12 fault  
d<sub>2</sub>:24 normal operation  
d<sub>2</sub>:22 fault

Wiring diagram 4

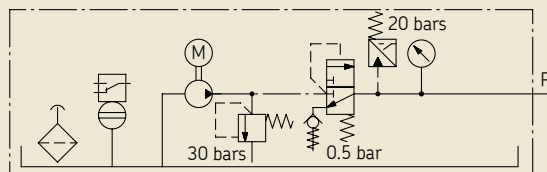


These connections are made by the customer

1) optional

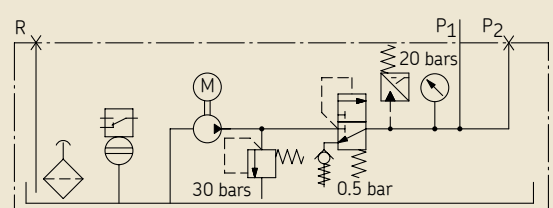
Hydraulic layout 1

MKU 1



Hydraulic layout 2

MKU 5



## Compact Units for Oil, Group MKU

The compact units with 3- or 6-liter reservoirs may be equipped with an electronic control unit for intermittently operated single-line central lubrication systems.

Optionally with

- IG38-30-I for time-dependent control
- IZ38-30-I for load-dependent control

IG12 for time-dependent control

(without monitoring functions)

The units conform to the following directives:

- Electromagnetic compatibility  
89/336/EWG; 91/31/EWG
- Low voltage directive  
73/23/EWG; 93/68/EWG

## Control and monitoring unit with pre-lubrication

IG38-30-I, time-dependent or IZ38-30-I, load-dependent

### Functions

- IG38-30-I: timer mode (time-dependent)
- IZ38-30-I: counter mode (load-dependent)
- Preliminary lubrication (lubrication after the supply voltage is switched on)
- Pump delay time
- Monitoring of pressure build-up
- Monitoring of pump runtime limitation
- Monitoring of lubricant level with wire-break detection (level indicator opens if lubricant level is critical)

### Technical data

|                                                  |                             |
|--------------------------------------------------|-----------------------------|
| Rated voltage . . . . .                          | 115 or 230 V AC             |
| Rated frequency . . . . .                        | 50/60 Hz                    |
| Interval duration preselectable in 12 stages:    |                             |
| IG38-30-I (min) . . . . .                        | 1; 2; 4; 8; 16; 32; 64; 128 |
| IZ38-30-I (pulses) . . . . .                     | 256; 512; 1024; 2048        |
| Pump delay time, nonadjustable . . . . .         | 15 s                        |
| Pump runtime limitation, nonadjustable . . . . . | 60 s                        |
| Design . . . . .                                 | board-mounted               |

## Control unit without pre-lubrication

IG12, time-dependent

### Functions

- Timer with adjustable interval time and constant lubrication time
- Operation always begins with an interval when the supply voltage is switched on
- Intermediate lubrication via pushbutton DK is possible at any time during an interval

### Technical data

|                                       |                                               |
|---------------------------------------|-----------------------------------------------|
| Rated voltage . . . . .               | 115 or 230 V AC                               |
| Rated frequency . . . . .             | 50/60 Hz                                      |
| Interval time (min)                   |                                               |
| preselectable in 10 stages: . . . . . | 1,5; 3; 6; 12; 24; 48; 96; 192; 384; 768      |
| As-delivered setting . . . . .        | interval time set for 1.5 min                 |
| Contact time, fixed . . . . .         | 20 s                                          |
| Design . . . . .                      | plastic housing                               |
| Terminal bloc for . . . . .           | level indicator (WS) and pressure switch (DS) |



**Order No. 1-1203-US**

Subject to change without notice! (06/2007)

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In particular, we call your attention to the fact that hazardous materials of any kind, especially the materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Par. 2, may only be filled into VOGEL centralized lubrication systems and components and delivered and/or distributed with the same after consultation with and written approval from VOGEL.

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Competence center for industrial applications

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