

**Operating Instructions**

**OI 1020**

**Electronic Positioner to be incorporated in motorized actuators baelz 373-E02, 373-E06, 373-E07, 373-E40, 373-E60 and baelz 373-E11 (mounted in plastic box on the valve yoke) or for incorporation into a panel baelz 1020 with terminals.**  
**Positioning signal 0...20 mA or 4...20 mA or 0...10 V or 2...10 V**  
**power supply 24 V AC/DC or alternatively for 230 V / 24 V**



**Contents**

**page**

1. General .....	1
2. Unit versions .....	2
3. Subsequent installation of the baelz 1020-24 V in motor actuator .....	3
4. Electrical connection .....	5
5. Overview of controls (basic setting) .....	8
6. Setting possibilities (with examples) .....	9
- Adaptation to different input signals	
- Zero and end point setting	
7. Technical data .....	11
8. Dimension drawing .....	12

**1. General**

The positioner baelz 1020 is intended for installation in motor actuators or, using an adapter board, also for switchgear cabinet installation.

It converts a preset continuous actuating signal (Yset) into a three-point output for a final controlling element motor.

The output is floating via relay contacts. The Y position is feedback by a 5 kΩ potentiometer.

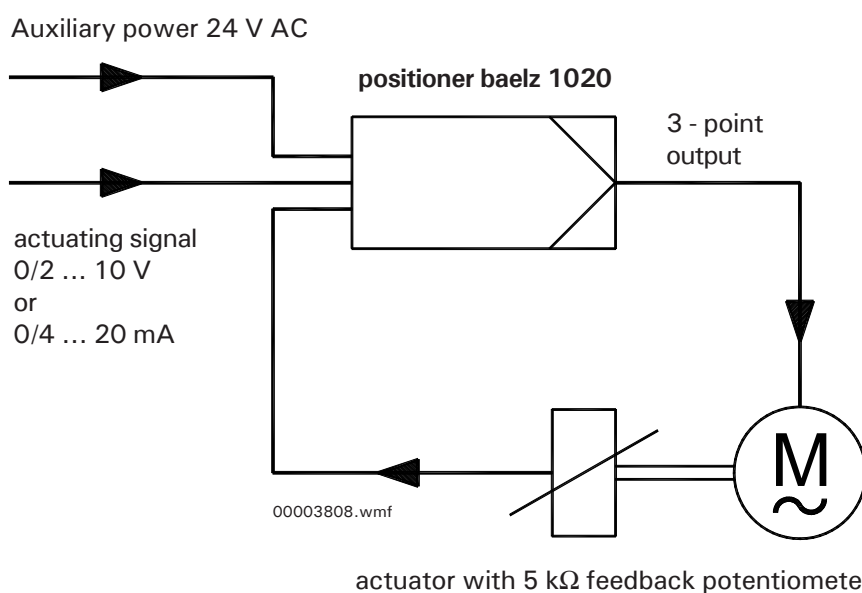
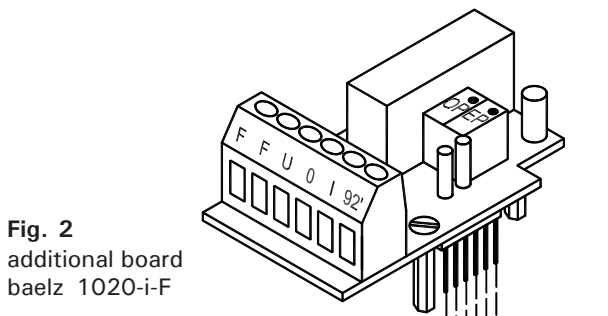


Fig. 1 schematic circuit diagram

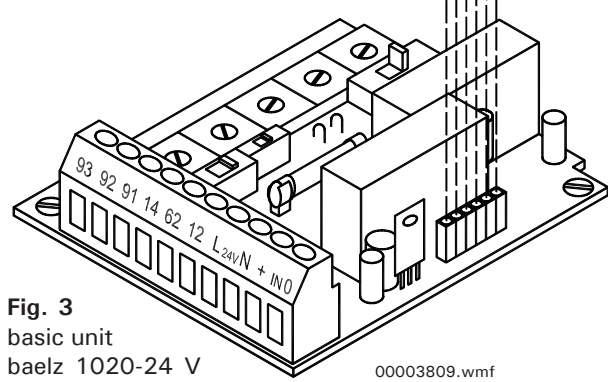
**Operating Instructions**

**OI 1020**

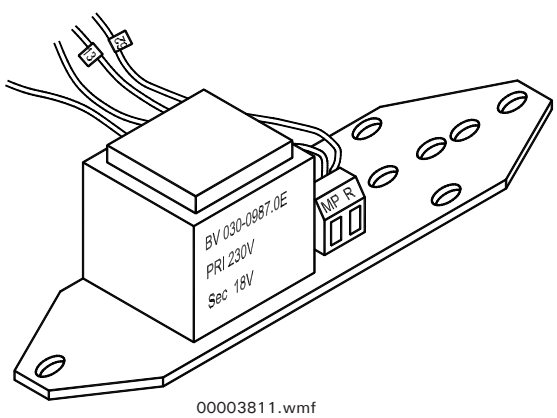
**2. Unit versions**



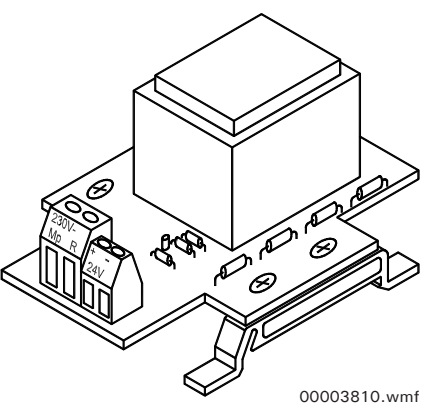
**Fig. 2**  
additional board  
baelz 1020-i-F



**Fig. 3**  
basic unit  
baelz 1020-24 V  
00003809.wmf



**Fig. 4** baelz 1020-SVA  
00003811.wmf



**Fig. 5** baelz 1020-SVW  
00003810.wmf

**Basic unit baelz 1020-24 V**

The function shown in Fig. 1 is implemented with this. On complete delivery (with actuator), the board is installed in the factory and wired with motor and remote sensor. The baelz 1020-24 V is delivered with appropriate accessories for subsequent installation.

**Additional boards (plugged into basic board)**

- baelz 1020-i: Indicating the valve or flap position by 0/2 ... 10 V or 0/4 ... 20 mA signal.
- baelz 1020-F: With frost protection relay, e.g. external "open" command via frost protection thermostat.
- baelz 1020-H: With manual intervention. Open / close commands via external switches.
- baelz 1020-i-F: Functions of the baelz 1020-i and baelz 1020-F combined.
- baelz 1020-i-H: Functions of the baelz 1020-i and baelz 1020-H combined.

**baelz 1020-SVA power supply**

for actuator installation if the motor needs 230 V and not 24 V supply voltage.  
 Input voltage: 230 V, 50/60 Hz  
 Output voltage: 24 V AC  
 Note: Installation in following baelz actuators not possible:  
 baelz 373-E11

**baelz 1020-SVW power supply**

for switchgear cabinet installation (rail mounting)  
 Input voltage: 230 V, 50/60 Hz  
 Output voltage: 24 V AC

**baelz 1020-W mounting base (not shown)**

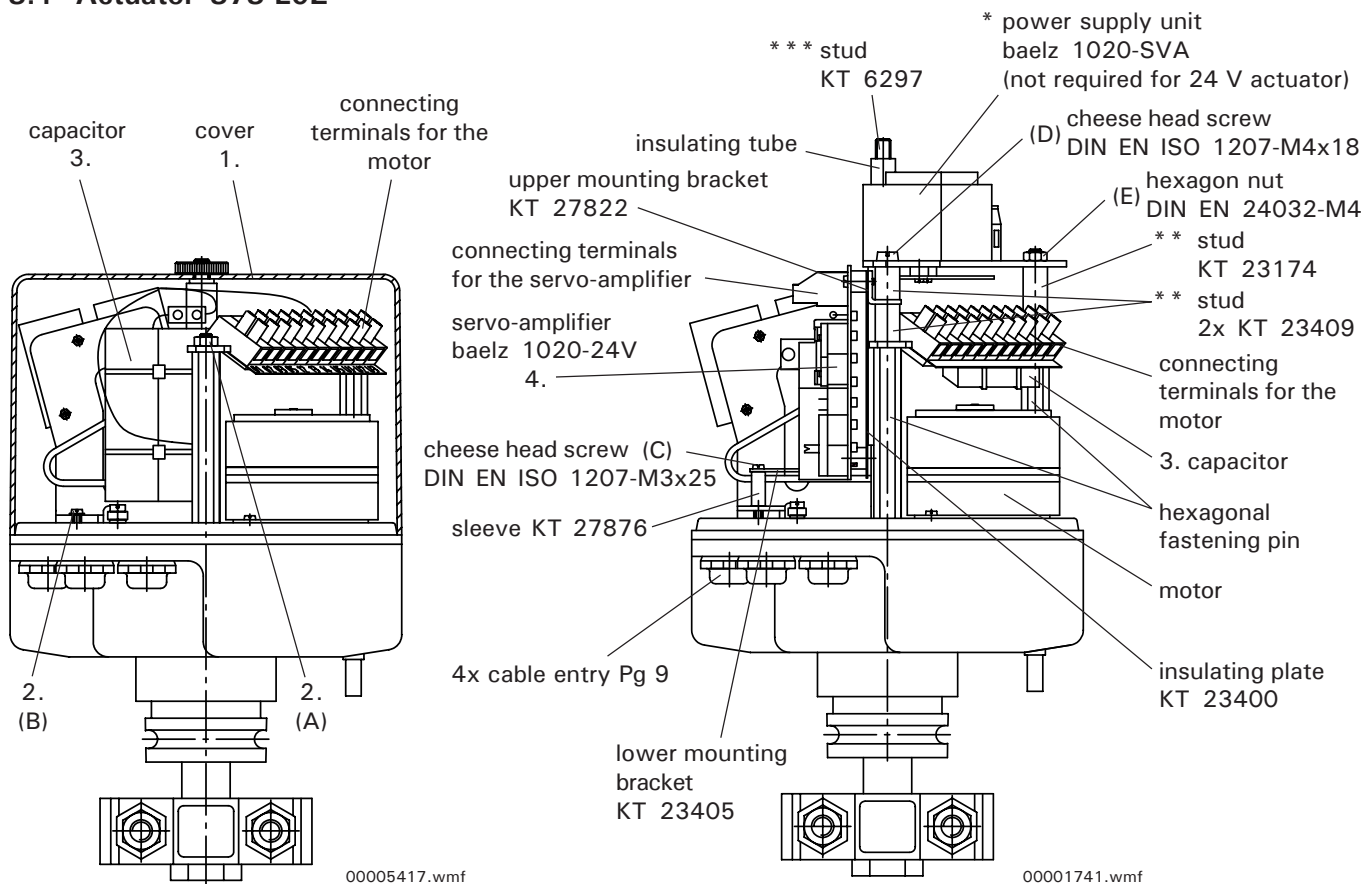
Enables the baelz 1020-24 V to be mounted on rails (switchgear cabinet internal installation).

**Operating Instructions**

**OI 1020**

**3. Subsequent installation of the baelz 1020 in motor actuator**

**3.1 Actuator 373-E02**

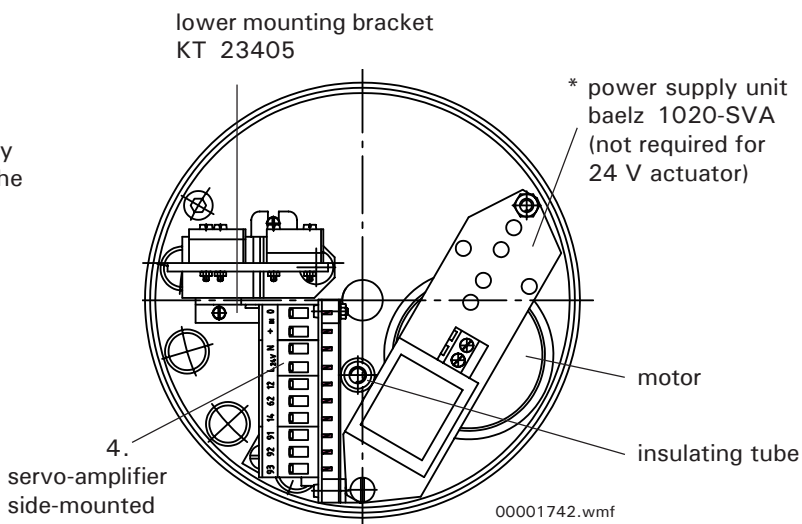


**Fig. 6** Actuator baelz 373-E02 in its basic version

\* If the motor of the actuator requires a supply voltage of 230 V and accordingly only one 230 V cable has been laid to the actuator, it will be necessary to install a power supply unit baelz 1020-SVA.

\*\* The power supply unit is attached by the use of 3 studs (2x KT 23409 + KT 23174) with hexagon nut (E) and cheese head screw (D).

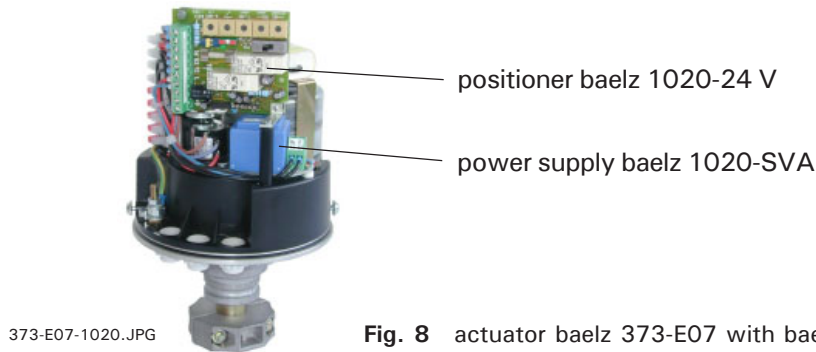
\*\*\* Caution: In case of a subsequent installation of the baelz 1020-SVA, an elongated cover KT 6115 and studs KT 6297 will be needed.



**Fig. 7** Actuator baelz 373-E02 with integrated baelz 1020

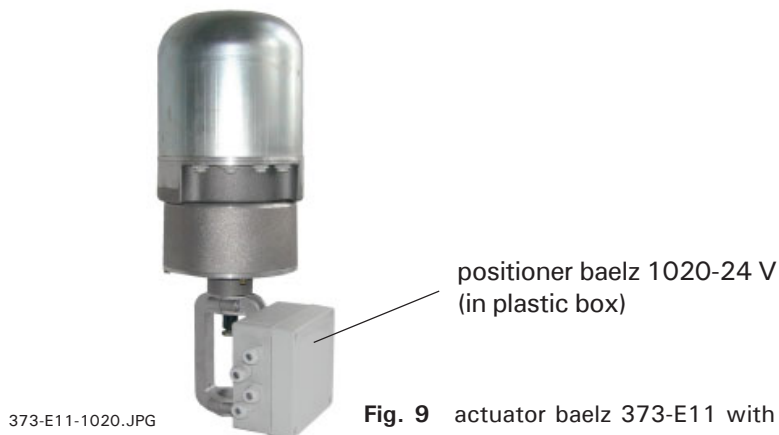
1. Remove the cover of the actuator by unscrewing the fastening nuts.
2. Unscrew the fastening nut (A) and the fastening screw (B).
3. Loosen the capacitor and fix it below the connecting terminals.
4. Install the servo-amplifier on the side, so that the connecting terminals are at the top (see top view fig. 7). Fasten the servo-amplifier by means of the cheese head screws (C + D) and a hexagon nut (E).

### 3.2 Actuator 373-E07 (see Operating Instructions BA 373-E07-Fg-1020)



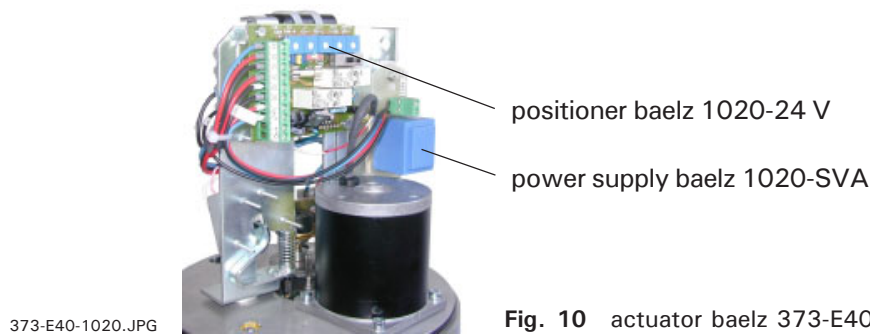
**Fig. 8** actuator baelz 373-E07 with baelz 1020-24 V positioner and baelz 1020-SVA power supply

### 3.3 Actuator 373-E11



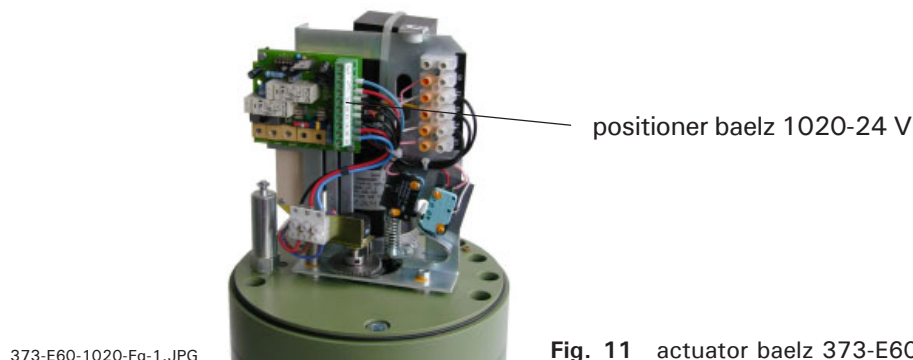
**Fig. 9** actuator baelz 373-E11 with baelz 1020-24 V positioner

### 3.4 Actuator 373-E40



**Fig. 10** actuator baelz 373-E40 with baelz 1020-24 V positioner and baelz 1020-SVA power supply

### 3.5 Actuator 373-E60



**Fig. 11** actuator baelz 373-E60 with baelz 1020-24 V positioner

4. Electrical connection

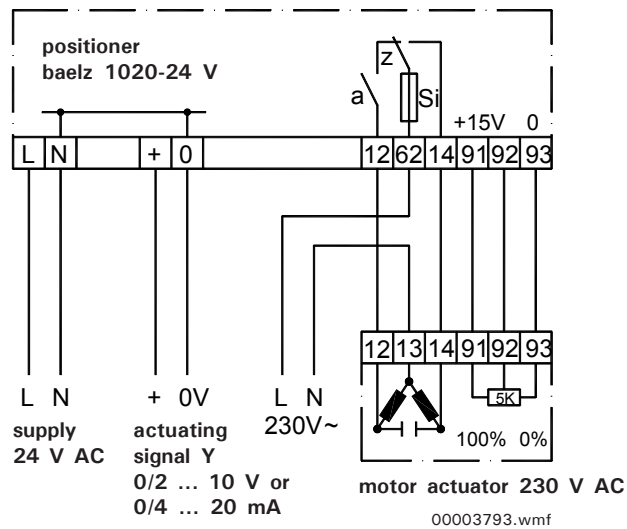


Fig. 12 motor actuator 230 V AC with baelz 1020-24 V positioner

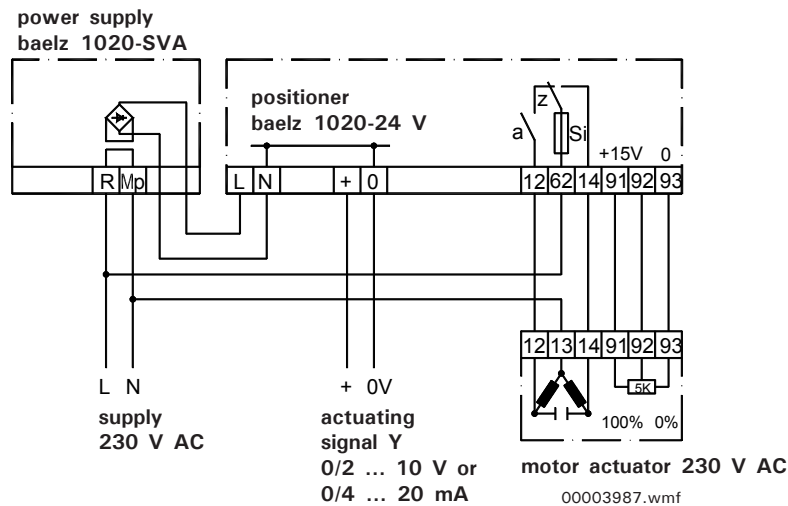


Fig. 13 motor actuator 230 V AC with baelz 1020-24 V positioner and baelz 1020-SVA-230/24 power supply

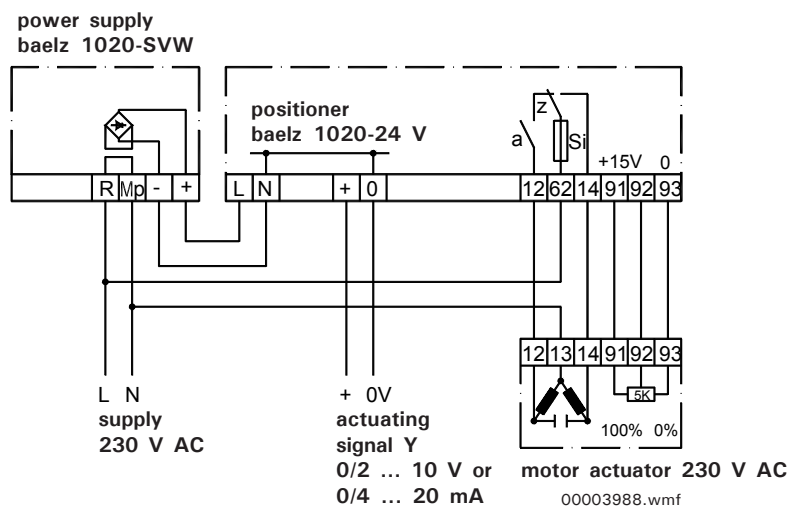


Fig. 14 motor actuator 230 V AC with baelz 1020-24 V positioner and baelz 1020-SVW-230/24 power supply

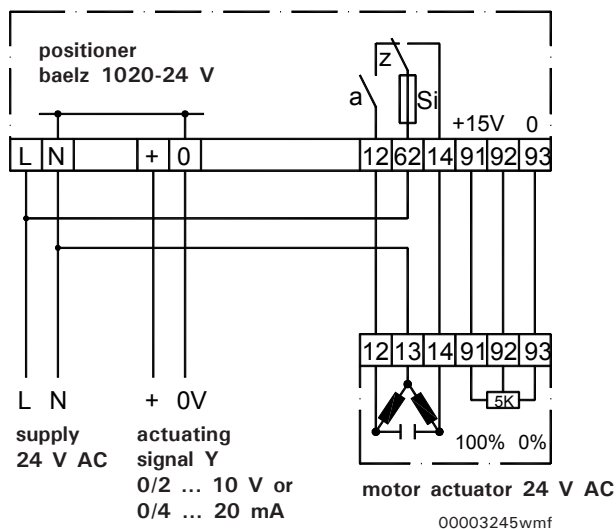


Fig. 15 motor actuator 24 V AC with baelz 1020-24 V positioner

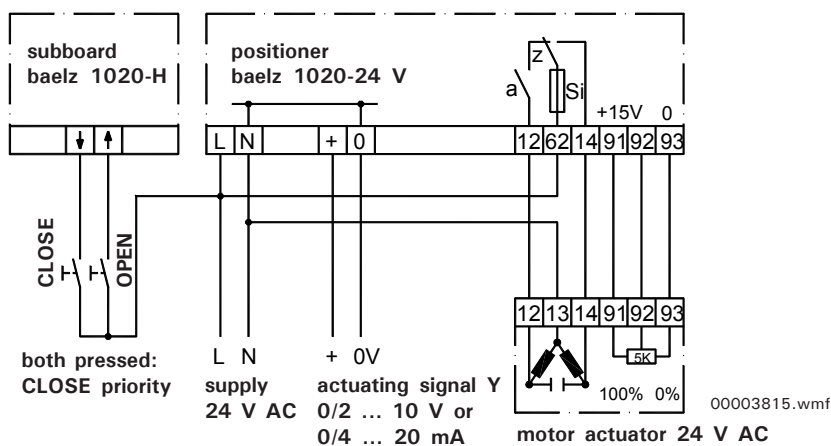


Fig. 16 motor actuator 24 V AC with baelz 1020-24 V-H positioner (with manual intervention)

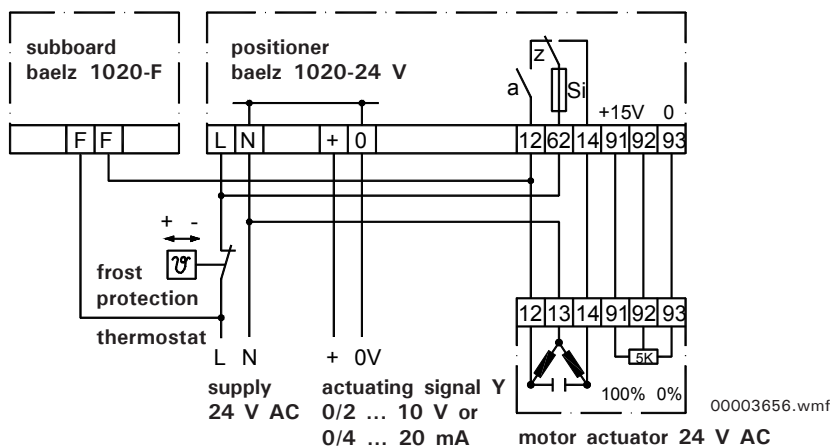
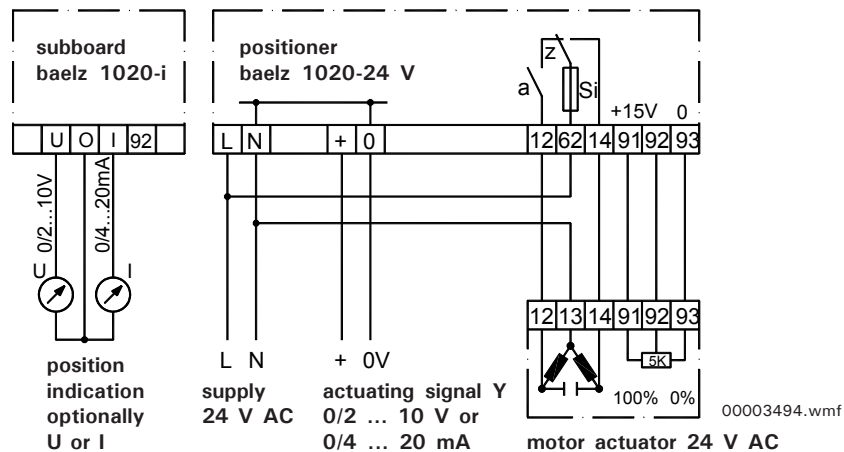


Fig. 17 motor actuator 24 V AC with baelz 1020-24 V-F positioner (with frost protection)

The frost protection relay releases on removal of the power supply. The motor can then be positively driven through the contact. (Delay necessary because of possible reverse voltage.)

**Operating Instructions**

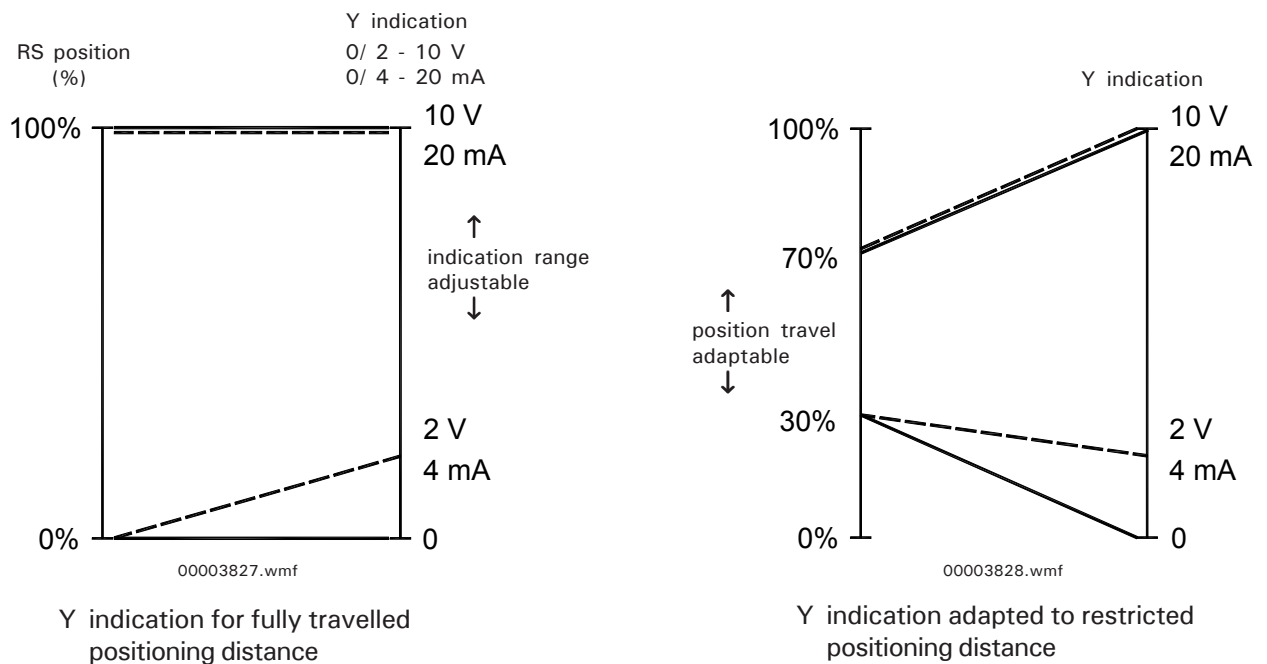
**OI 1020**



**Fig. 18** motor actuator 24 V AC with baelz 1020-24 V-i positioner (with position indication)

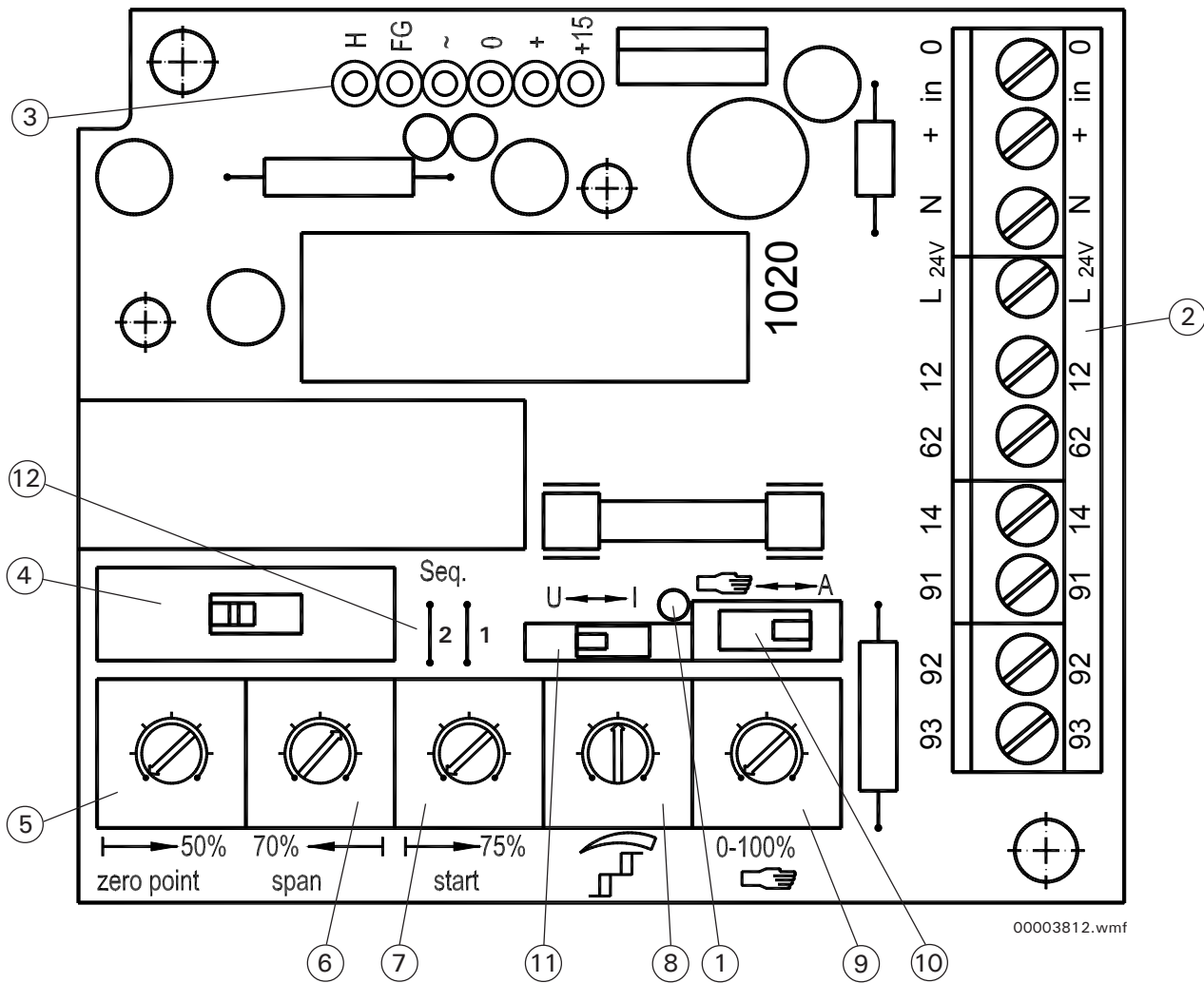
The position indication can be by 0/2 - 10 V or 0/4 - 20 mA. The indication range is adjustable, or can be adapted to the positioning distance.

Setting with OP pot. (OP max. 30 %) and EP pot. (EP min. 70 %), siehe Fig. 2.



**Fig. 19** adaption of the position indication to "restricted" positioning distance

5. Overview of the controls (basic setting)



drawn pot. or switch positions = condition on delivery

Fig. 20 controls

- 1 Operating LED (power supply OK)
- 2 Connection terminal block
- 3 Plug-in base (el. connection) for additional boards (frost protection, position indication, manual intervention)
- 4 Switch for reversing the direction of control action (see 6.3)
- 5 Zero point setting (0...50 %) - independent of input signal
- 6 End point setting (70...100 %)
- 7 (Actuator) onset point setting (0...75%), e. g. necessary for changing from 0...20 mA to 4...20 mA input signal
- 8 Switching gap between "CLOSE" relay release and "OPEN" relay pickup adjustable from 0.6 %...2.7 % (related to 5 kΩ remote sensor (0 - 100 %))
- 9 Potentiometer for manual setting of actuating signal - ext. input signal is separated (only if switch 10 is at "MANUAL")
- 10 Slide switch "MANUAL - AUTOMATIC"
- 11 Slide switch for selecting input signal U or I
- 12 Wire jumpers for sequential operation (see 6.1)



**Operating Instructions**

**OI 1020**

**6. Setting possibilities**

To set a baelz 1020 within a baelz 373-E07 the feedback potentiometer must be put mechanically in a position of 50% stroke as follows (see as well Operating Instructions of BA 373-E07-Fg-1020):

- Remove potentiometer out of its position in the actuator
- Turn the potentiometer spindle 5 turns into its end position and afterwards back into its 0 position
- Position the valve into its 50 % stroke position
- Incorporate potentiometer again on its prior position

**6.1 Setting the baelz 1020 for sequence control**

By opening a first wire bridge there is only used 47 % of the input signal and by opening another wire bridge there is only used 30 % of the input signal.

The start point can be set by potentiometer (7) "START" from 0 - 75 % of the input signal.

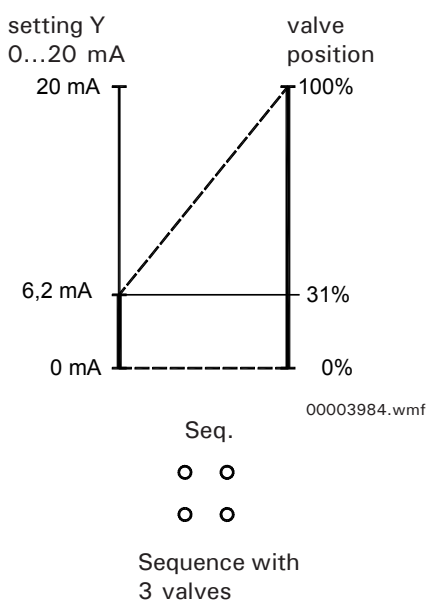


Fig. 21a

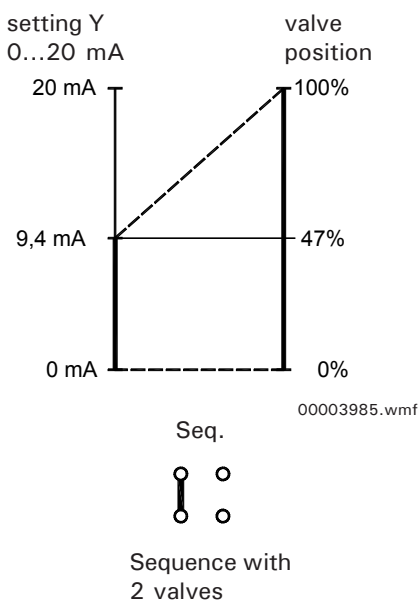


Fig. 21b

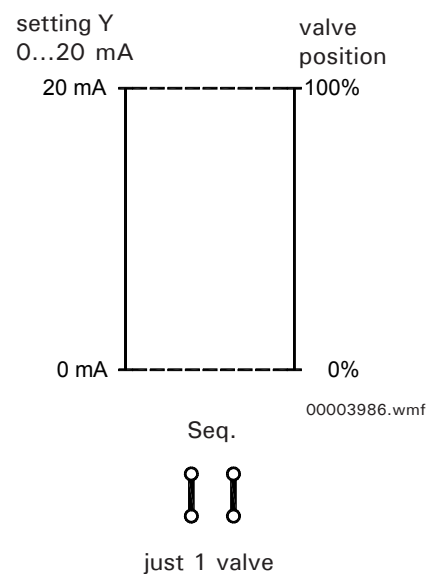


Fig. 21c

**Operating Instructions**

**OI 1020**

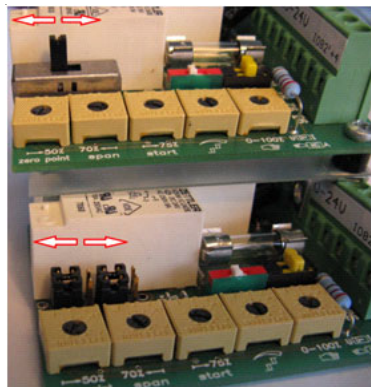
Note following setting sequence on commissioning:

**6.2 Basic choice between current or voltage actuating signal**

(e. g. 0/2...10 V or 0/4...20 mA) with aid of U / I selector switch (11)

**6.3 Selection of the direction of control action by switch or jumper (4)**

In switch/jumper position as shown in fig. 20 + 22, the „OPEN“ command is output at terminal 12 and „CLOSE“ at terminal 14. When the switch is operated or the 4 jumpers are changed, actuation of the OPEN/CLOSE relays and the potentiometer connections 91-93 are internally reversed. It is thus not necessary to change over the potentiometer connections!



Type with switch		
Type with jumper		
<b>Caution</b> Do not change the jumpers when they are energized.		

Fig. 22 Switch/jumper for direction of control action

**6.4 Determining zero point**

Let valve run "CLOSED" with aid of the manual pot. (9) until the limit switch responds or the wanted min. point is reached. Switch (10) must be set to manual setting. Correct with "zero point" pot. until adjustment is made in the wanted min. position (in the example 0 → 40 %).

**6.5 Determining end point**

Let valve run "OPEN" until the limit switch responds or wanted max. point is reached. Correct with "span" pot. until adjustment is made in the wanted max. position (in the example 100 → 80 %).

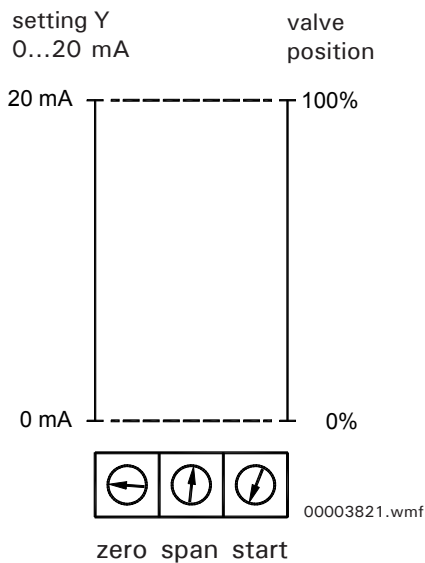


Fig. 23a

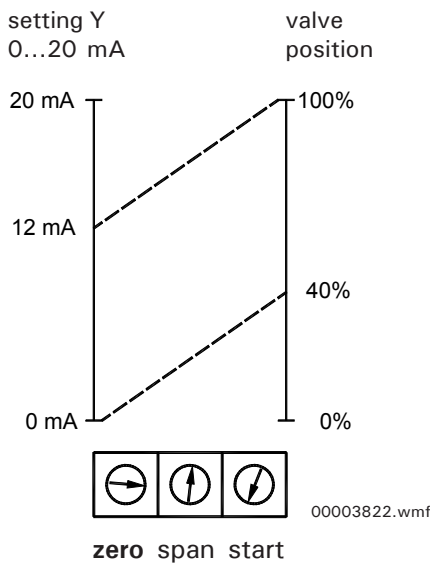


Fig. 23b

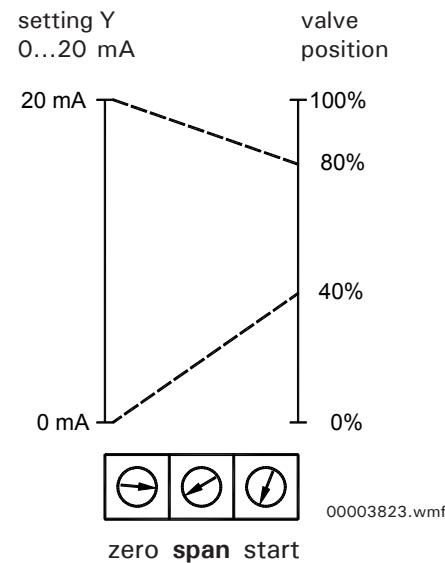


Fig. 23c

Note: The setting of the zero point produces a parallel shift of the entire valve travel (Fig. 23b) - the end point must be adapted after each adjustment (Fig. 23c).

**Operating Instructions**

**OI 1020**

**6.6 Determining start point**

A part of the input signal (max. 75 %) in the starting range can be "suppressed" with the aid of the "START" pot. (7). This is necessary, for instance, for 2...10 V or 4...20 mA signal.

Example: Changing from 0...20 mA (Fig. 24a) to 4...20 mA version (Fig. 24c).

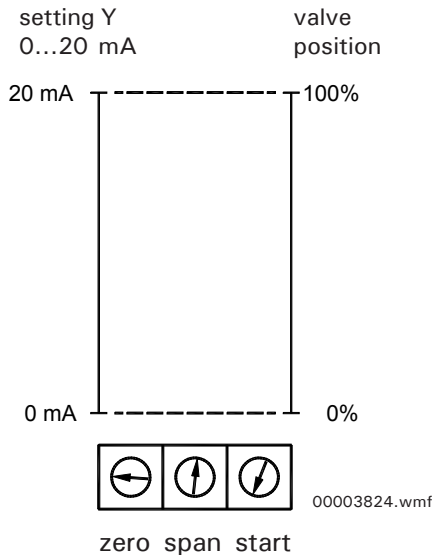


Fig. 24a

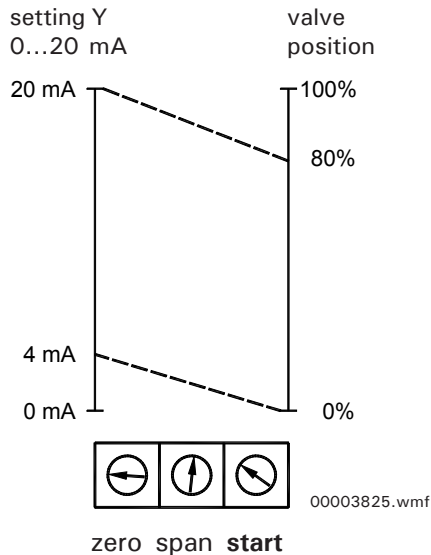


Fig. 24b

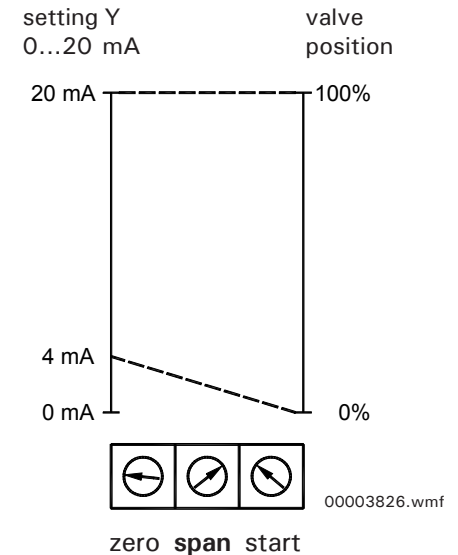


Fig. 24c

After the "start point" (Fig. 24b) is changed, the end point must be adapted accordingly (Fig. 24c) as is the case after a zero point change.

Notes: The drawn pot. positions are intended only as a coarse setting aid. However, exact tuning is possible only with the aid of a controllable current or voltage source (so-called segment amplifier). All numbers for identifying the controls refer to Fig. 20.

**7. Technical data**

- power supply:** 24 V ~ or 24 V
- input signal:** selectable by switches 0...10 V, 2...10 V ( $R_i = 10,7 \text{ k}\Omega$ )  
or 0...20 mA, 4...20 mA ( $R_i = 100 \text{ }\Omega$ )
- switching gap:** Gap between "CLOSE" relay release and "OPEN" relay pickup  
adjustable: 0.6 %...2.7 %
- power consumption:** 4 VA at 24 V, 50/60 cycles
- subboard 1020-i:** current-output: max. load = 600  $\Omega$   
voltage-output: max. current = 20 mA

8. Dimension drawing

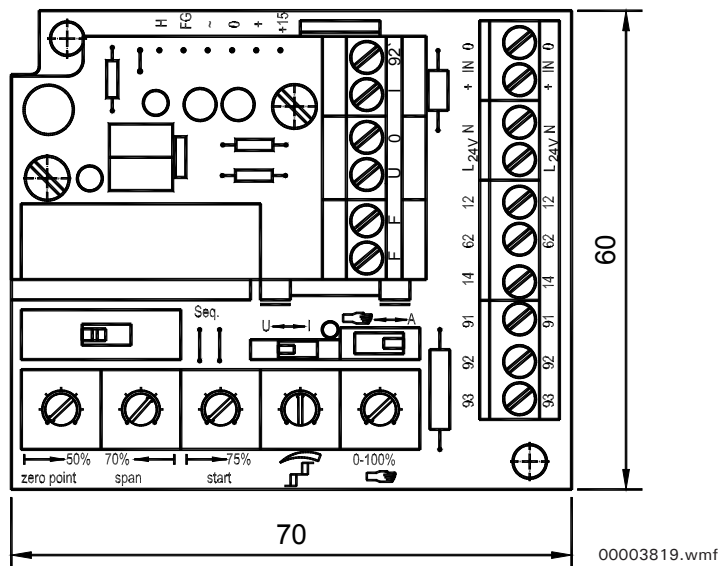
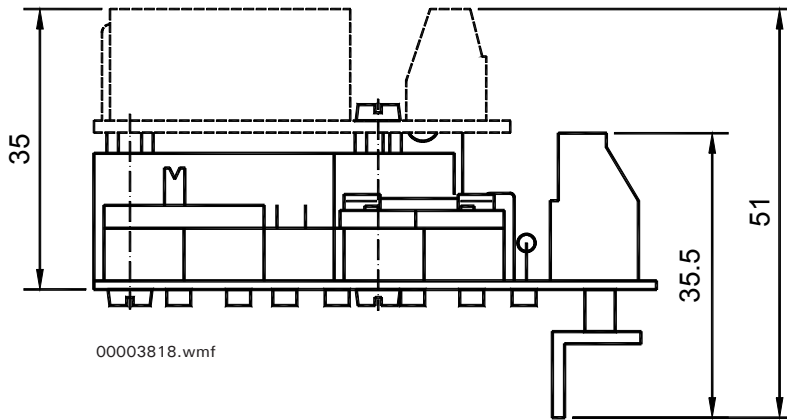


Fig. 25 baelz 1020-24 V dimension drawing