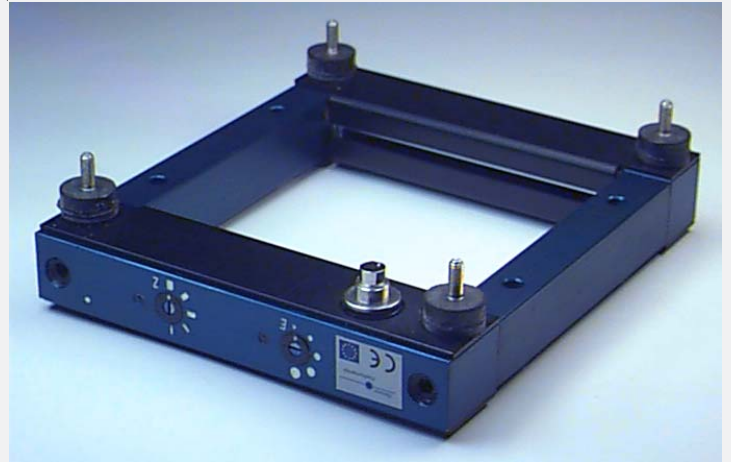


FLB Series

► FLB-FR1-...

- Integrated electronics
- High sensitivity (adjustable via 5-step-switch)
- Pulse length adjustable via 5-step-switch
- Dynamic and static output
- Analog output (0V ... +10V)
- Switching state indication by means of red/green LED
- Dirt accumulation indication by means of yellow LED
- Various frame sizes available (light curtain 60 mm ... 300 mm)
- Optics mechanically protected by means of baffle plate
- Sturdy aluminum housing

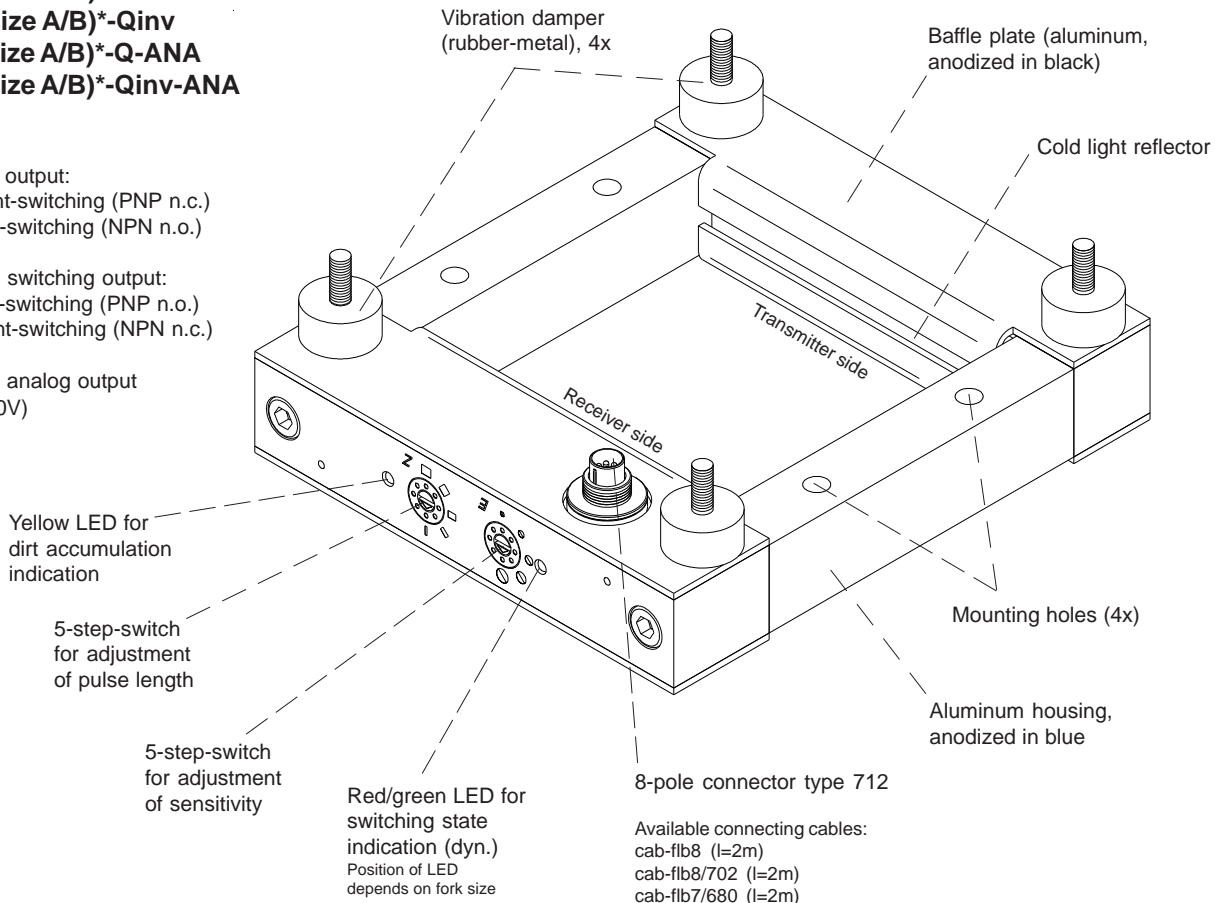


Design

Product name:

- FLB-FR1-(frame size A/B)*-Q
- FLB-FR1-(frame size A/B)*-Qinv
- FLB-FR1-(frame size A/B)*-Q-ANA
- FLB-FR1-(frame size A/B)*-Qinv-ANA

- Q = Switching output:
PNP bright-switching (PNP n.c.)
NPN dark-switching (NPN n.o.)
- Qinv = Additional switching output:
PNP dark-switching (PNP n.o.)
NPN bright-switching (NPN n.c.)
- ANA = Additional analog output
(0V ... +10V)



*Available frame sizes (A/B):
(please cf. pages 4 and 5: „dimensions“)

A = 60 / 80 / 100 / 160 / 200 / 300 mm (width of cold light reflector)
B = 60 / 80 / 100 / 160 / 200 / 300 mm (distance between transmitter and receiver)

(any „A“ can be combined with any „B“)



Technical Data

Model	FLB-FR1-...	
Max. transmitter/ receiver distance	300 mm	
Min. detectable object	with dim. A = 60, 80, 100 mm: typ. 0.3 mm with dim. A = 160 mm: typ. 0.5 mm with dim. A = 200 mm: typ. 0.7 mm with dim. A = 300 mm: typ. 1.0 mm	
Analog output (0V ... +10V)	optional	
Optical filter	Cold-light reflector	
Light type	Infrared	
Voltage supply	+12VDC ... +32VDC, protected against polarity reversal, overload protected	
Pulsating light operation	approx. 5 kHz	
Ambient light	up to 5000 Lux	
Type of protection	IP67	
Current consumption	200 mA	
EMC test acc. to	DIN EN 60947-5-2	
Connector type	8-pole connector, Binder series 712	
Operating temperature range	-20°C ... +60°C	
Storage temperature range	-20°C ... +85°C	
Housing	Aluminum, anodized in blue	
Max. switching current	200 mA, short-circuit-proof	
Switching frequency	typ. 1 kHz	
Outputs	All types: additionally for type "Q": for type "Qinv": for type "Q-ANA": for type "Qinv- ANA":	1x QUASI STATIC (typ. 10....200s, depends on degree of covering of optics) 1x DIRT ACCUMULATION 1x DYNAMIC (pnp bright-switching = pnp n.c. / npn dark-switching = npn n.o.) 1x DYNAMISCH (pnp bright-switching = pnp n.c. / npn dark-switching = npn n.o.) 1x INVERS DYNAMIC (pnp dark-switching/ = pnp n.o. / npn bright-switching = npn n.c.) 1x DYNAMIC (pnp bright-switching = pnp n.c. / npn dark-switching = npn n.o.) 1x ANALOG (0V...+10V) 1x INVERS DYNAMIC (pnp dark-switching/ = pnp n.o. / npn bright-switching = npn n.c.) 1x ANALOG (0V...+10V)
Sensitivity setting	in 5 steps by means of step switch	
Pulse lengthening	in 5 steps by means of step switch (20 ms ... 300 ms)	
Dirt accumulation display	By means of yellow LED and digital DIRT ACCUMULATION output	
Switching state display	By means of bi-color LED: RED (object passes light curtain) / GREEN (light curtain free, or no change)	

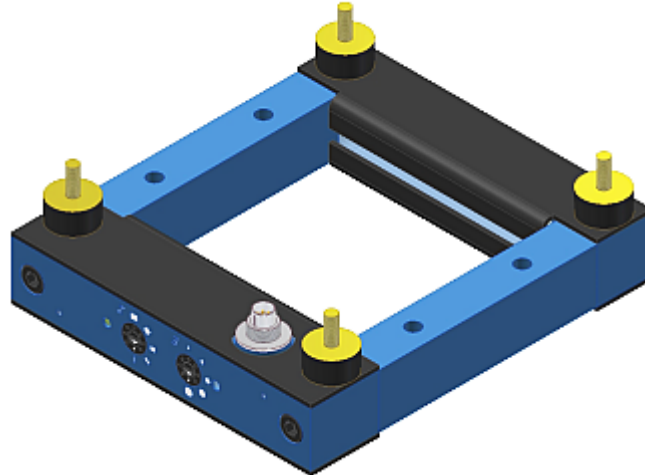


Design

FLB-FR1-(A/B)
for A = 60 mm ... 100 mm

Frame size A/B (in mm):

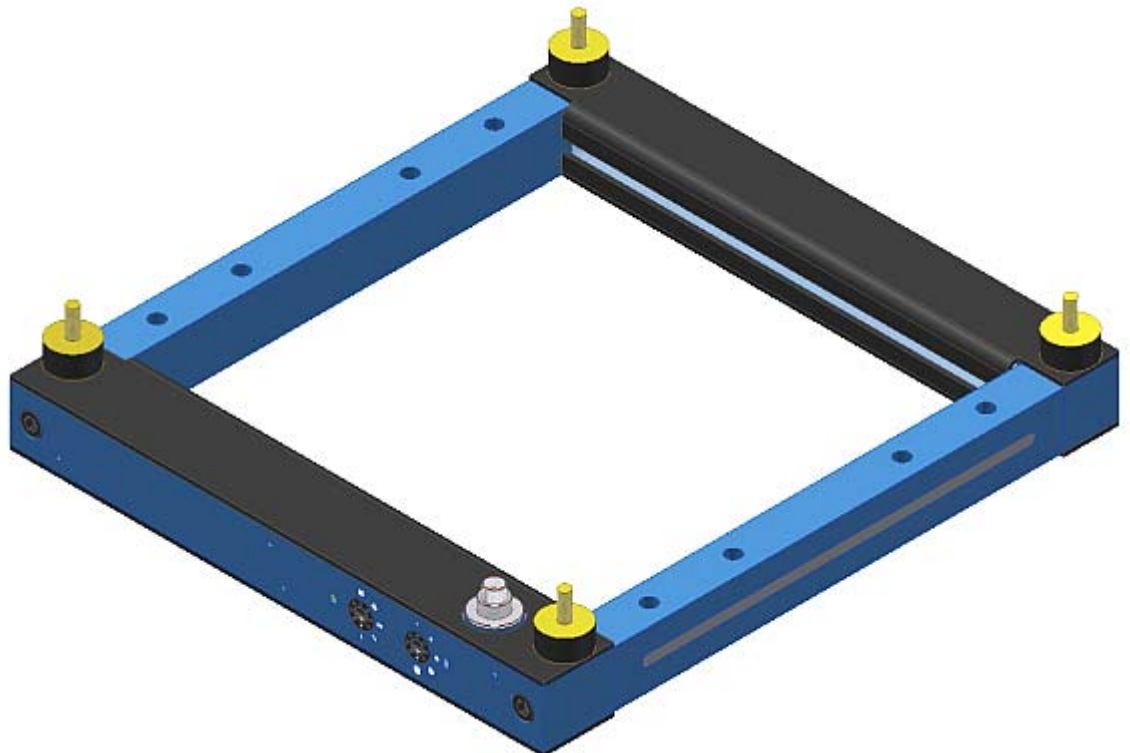
- 60/...
- 80/...
- 100/...



FLB-FR1-(A/B)
for A = 160 mm ... 300 mm

Frame size A/B (in mm):

- 160/...
- 200/...
- 300/...





Dimensions

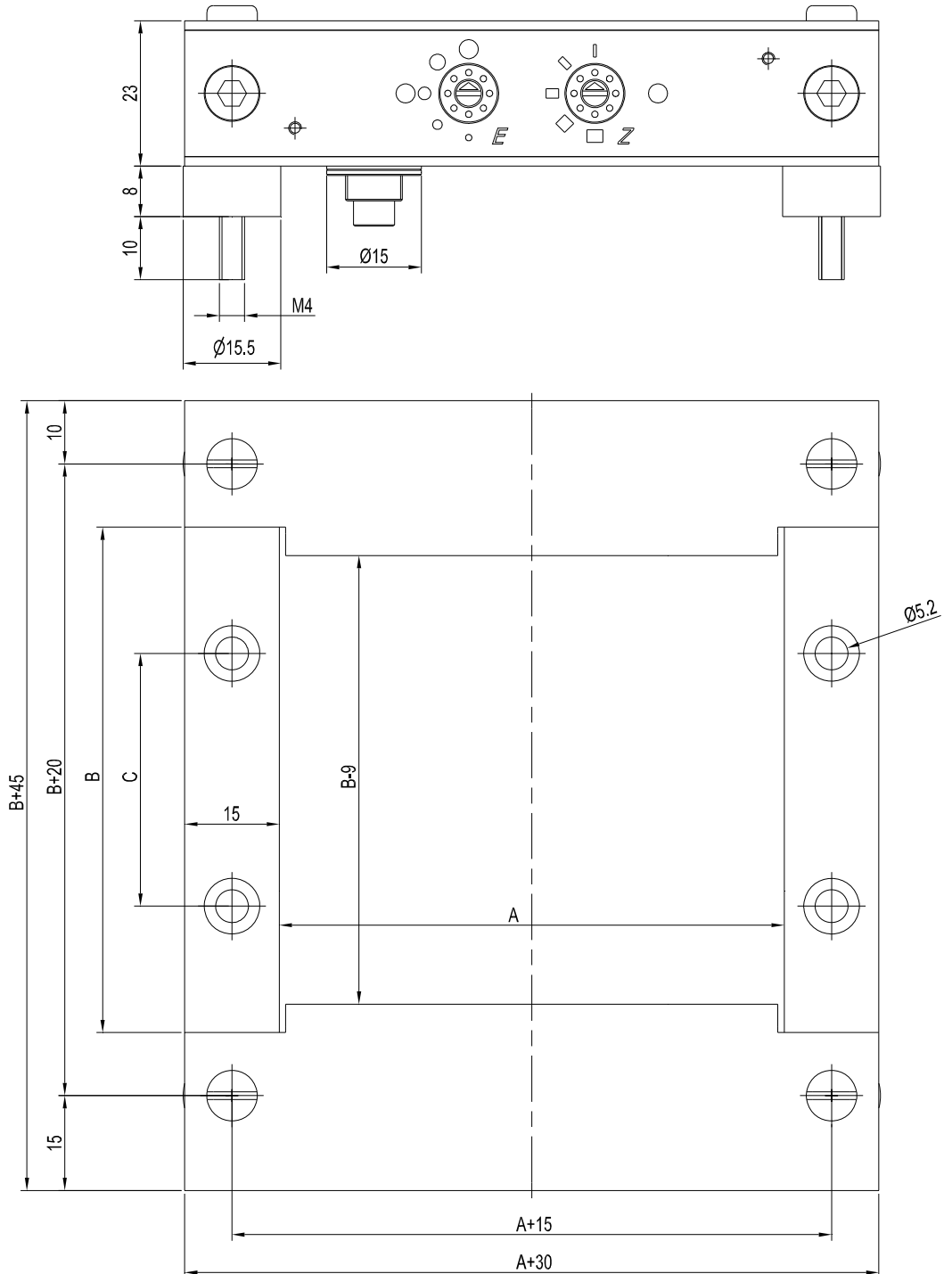
FLB-FR1-(A/B)
for A = 60 mm ... 100 mm

Fork size A/B (in mm):

- 60/60
- 60/80
- 60/100
- 60/160
- 60/200
- 60/300

- 80/60
- 80/80
- 80/100
- 80/160
- 80/200
- 80/300

- 100/60
- 100/80
- 100/100
- 100/160
- 100/200
- 100/300



	A	B	C	
Size 60	60	60	20	mm
Size 80	80	80	40	mm
Size 100	100	100	60	mm

(All dimensions in mm)



Dimensions

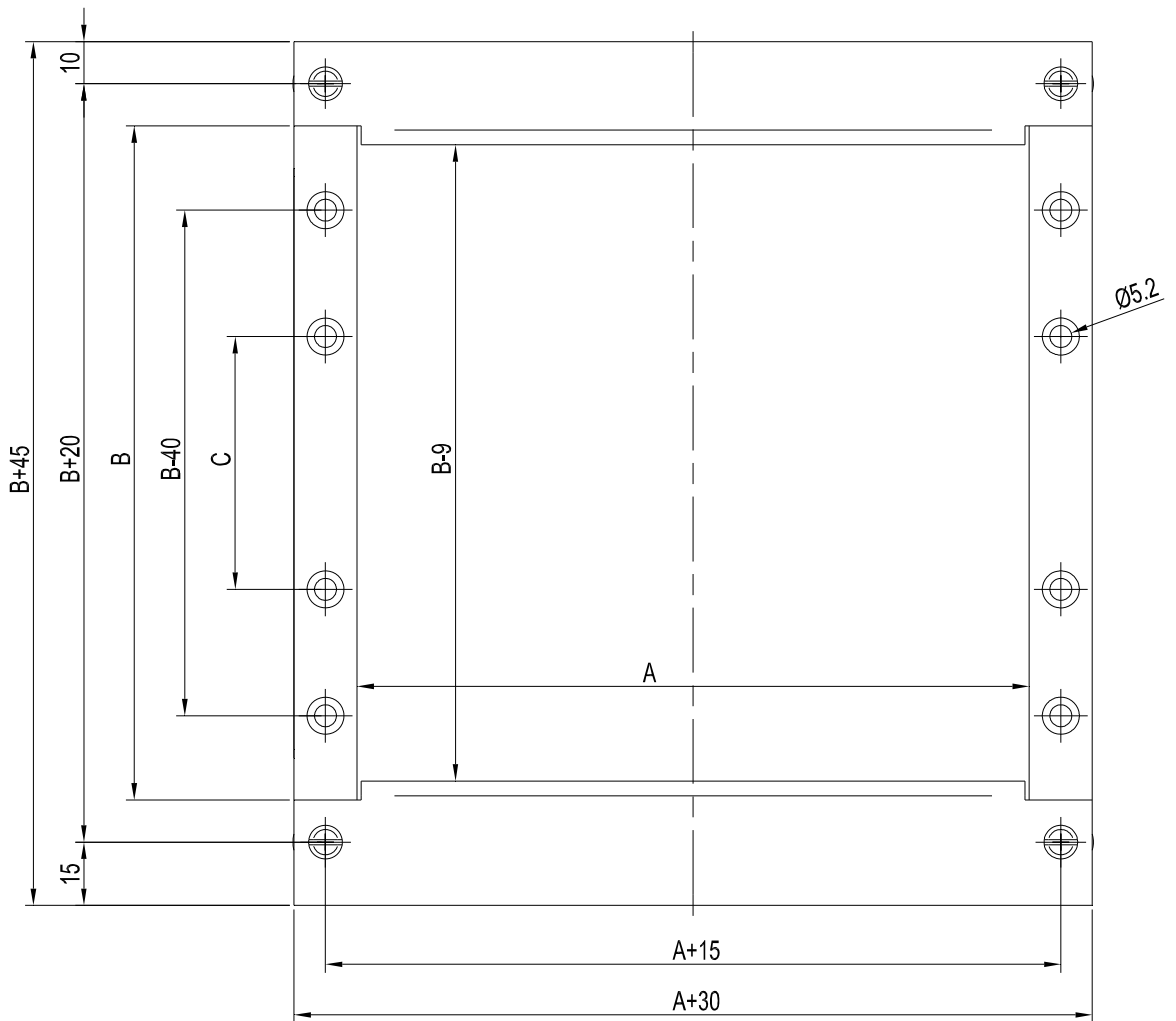
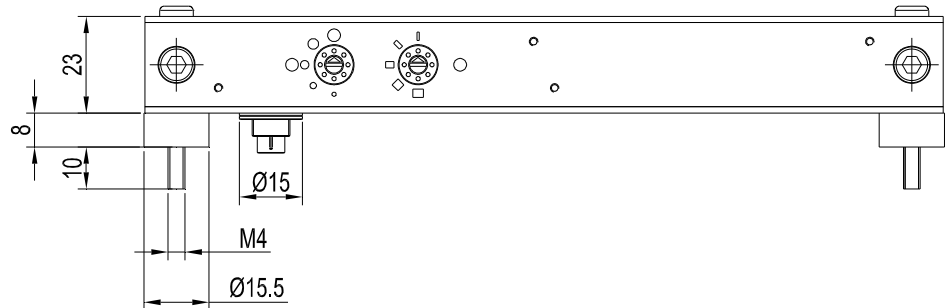
FLB-FR1-(A/B)
for A = 160 mm ... 300 mm

Fork size A/B (in mm):

- 160/60
- 160/80
- 160/100
- 160/160
- 160/200
- 160/300

- 200/60
- 200/80
- 200/100
- 200/160
- 200/200
- 200/300

- 300/60
- 300/80
- 300/100
- 300/160
- 300/200
- 300/300



	A	B	C	
Size 160	160	160	60	mm
Size 200	200	200	60	mm
Size 300	300	300	80	mm

(All dimensions in mm)

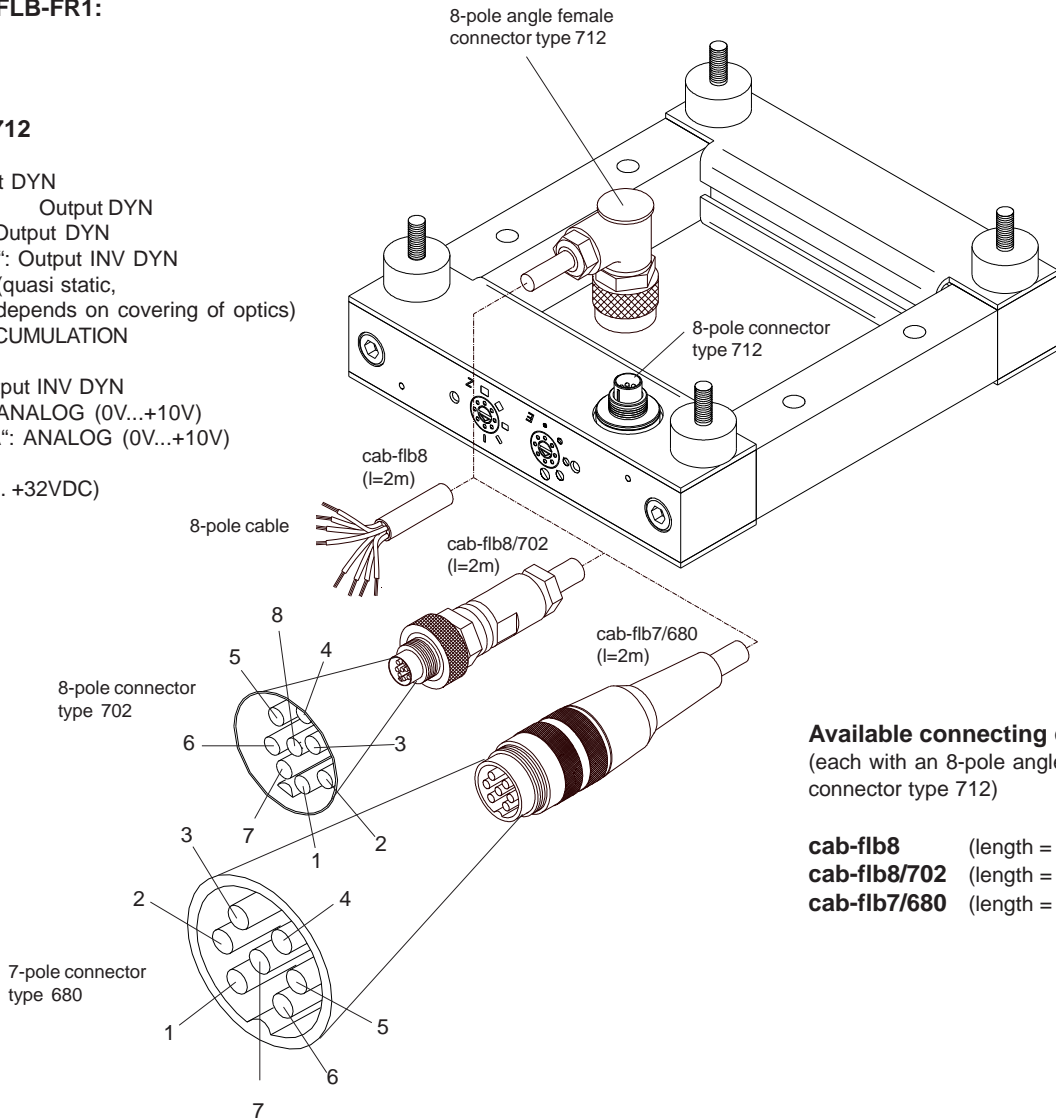


Connector Assignment

Connector assignment FLB-FR1:

8-pole connector type 712

Pin No.:	Assignment:
1	with „Q“: Output DYN with „Qinv“: Output DYN with „Q-ANA“: Output DYN with „Qinv-ANA“: Output INV DYN
2	Output QSTAT (quasi static, typ. 10...200s, depends on covering of optics)
3	Output DIRT ACCUMULATION
4	with "Q": n.c. with "Qinv": Output INV DYN with "Q-ANA": ANALOG (0V...+10V) with „Qinv-ANA“: ANALOG (0V...+10V)
5	GND (0V)
6	+Ub (+12VDC ... +32VDC)
7	not connected
8	not connected



Available connecting cables:
(each with an 8-pole angle female connector type 712)

- cab-flb8** (length = 2m)
- cab-flb8/702** (length = 2m)
- cab-flb7/680** (length = 2m)

Connecting cable cab-flb7/680

Pin No.:	Assignment:	Color:
1	with "Q": Output DYN with "Qinv": Output DYN with "Q-ANA": Output DYN with „Qinv-ANA“: Output INV DYN	white
2	Output QSTAT (quasi static, typ. 10...200s, depends on covering)	black
3	Output DIRT ACCUMULATION	grey
4	with "Q": n.c. with "Qinv": Output INV DYN with "Q-ANA": ANALOG (0V...10V) with „Qinv-ANA“: ANALOG (0V...10V)	yellow
5	GND (0V)	blue
6	+Ub (+12VDC ... +32VDC)	brown
7	not connected	green

Connecting cable cab-flb8 or cab-flb8/702

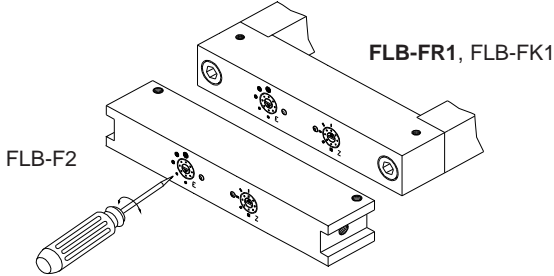
Pin No.:	Assignment:	Color:
1	with "Q": Output DYN with "Qinv": Output DYN with "Q-ANA": Output DYN with „Qinv-ANA“: Output INV DYN	white
2	Output QSTAT (quasi static, typ. 10...200s, depends on covering)	black
3	Output DIRT ACCUMULATION	grey
4	with "Q": n.c. with "Qinv": Output INV DYN with "Q-ANA": ANALOG (0V...10V) with „Qinv-ANA“: ANALOG (0V...10V)	yellow
5	GND (0V)	blue
6	+Ub (+12VDC ... +32VDC)	brown
7	not connected	green
8	not connected	



Setting

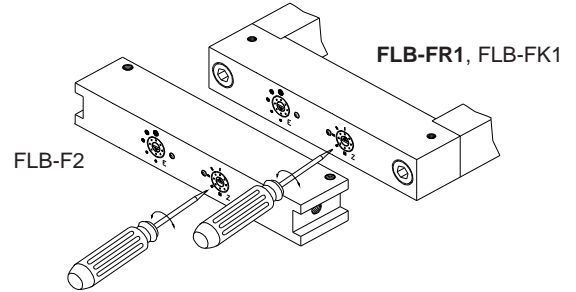
Sensitivity setting (step-switch „E“):

Sensitivity can be adjusted by means of a step-switch. The term 'sensitivity' defines the minimum detectable part size. The sensitivity can be adjusted in 5 steps.



Adjustment of pulse lengthening (step-switch „Z“):

The pulse length of the dynamic output can be adjusted by means of a step-switch. 5 pulse lengths are available.

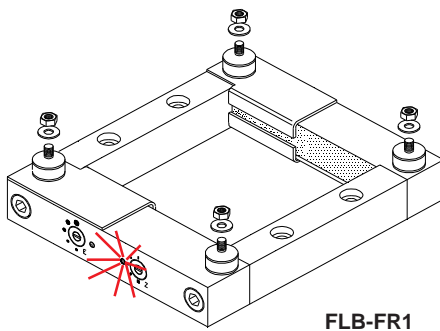


Step	Part size (dyn.)	Part size (stat.)
	$\geq 0.5 \text{ mm}$	$\geq 2 \text{ mm}$
	$\geq 0.7 \text{ mm}$	$\geq 3 \text{ mm}$
	$\geq 1.3 \text{ mm}$	$\geq 5 \text{ mm}$
	$\geq 1.7 \text{ mm}$	$\geq 7 \text{ mm}$
	$\geq 2.5 \text{ mm}$	$\geq 10 \text{ mm}$

Step	Pulse length
	300 ms
	200 ms
	100 ms
	50 ms
	20 ms

Dirt accumulation display (yellow LED):

In addition to a digital dirt accumulation output the user is informed about the dirt accumulation status by means of a yellow LED. If this yellow LED lights up, the transmitter or receiver side should be checked for dirtying.



Switching state display (red/green LED):

The switching state is indicated by a red/green LED. In case that a measuring object is detected, the LED changes from GREEN to RED. The two-color-LED is coupled to the dynamic output, i.e. after pulse end the LED returns to its starting state = GREEN.

