

Standstill monitoring

FWS 2506



- Detects standstill using 1 impulse sensor
- Control Category 3 to EN 954-1
- 4 enabling paths
- Operating voltage 24 ... 230 VAC/DC
- Reset input
- 2 short-circuit proof additional transistor outputs
- 1 signalling contact
- ISD Integral System Diagnostics
- 2 channel microprocessor controlled
- Customer-specific standstill frequencies possible

Technical data

Standards:	EN 60204-1; EN 954-1; BG-GS-ET-20
Control category:	3
Enclosure:	glass-fibre reinforced thermoplastic, ventilated
Mounting:	snaps onto standard DIN rail to EN 50022
Connection:	screw terminals
Cable section:	min. 0,2 mm ² , max. 2.5 mm ² solid or multi-strand lead (incl. conductor ferrules)
Protection class:	IP 20 to EN 60529
U _e :	24 ... 230 VAC/DC
I _e :	max. 0.4 A
Monitored inputs	2 channels, pulse generator p-type
Input resistance:	approx. 4 kΩ to ground
Input signal "1":	10 ... 30 VDC
Input signal "0":	0 ... 2 VDC
Max. cable length:	100 m of 0.75 mm ² conductor
Standstill frequency:	version A: input X1/X2: 1 Hz/2 Hz version C: input X1/X2: 1 Hz/1 Hz other versions: on request
Hysteresis:	10 % of standstill frequency
Max. input frequency:	1000 Hz
Min. pulse duration:	500 μs
Enabling contacts:	4 enabling paths
Additional contacts:	51-52: NC contact not suitable for safety functions
Utilisation category:	AC-15, DC-13
I _e /U _e :	3 A / 230 VAC 2 A / 24 VDC
Contact load capacity:	max. 250 VAC, max. 6 A (cos φ = 1)
Max. fuse rating:	6 A gG D-fuse
Signalling output:	2 transistor outputs, 24 VDC, Y1 + Y2 = max. 100 mA, p-type, short-circuit proof
Function display:	LED (ISD)
EMC rating:	conforming to EMC Directive
Overtoltage category:	III to DIN VDE 0110
Degree of pollution:	2 to DIN VDE 0110
Resistance to vibration:	10 ... 55 Hz / amplitude 0.35 mm
Resistance to shock:	30 g / 11 ms
Ambient temperature:	0 °C ... + 55 °C
Storage and transport temperature:	- 25 °C ... + 70 °C
Dimensions:	45 x 100 x 121 mm
Note:	Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

Approvals

   in preparation



Ordering details

FWS 2506 ①

No.	Replace	Description
①		Standstill frequencies Inputs X2/X4:
	A	1 Hz/2 Hz
	C	1 Hz/1 Hz

Additional transistor output:


Y1
Y2

Function:

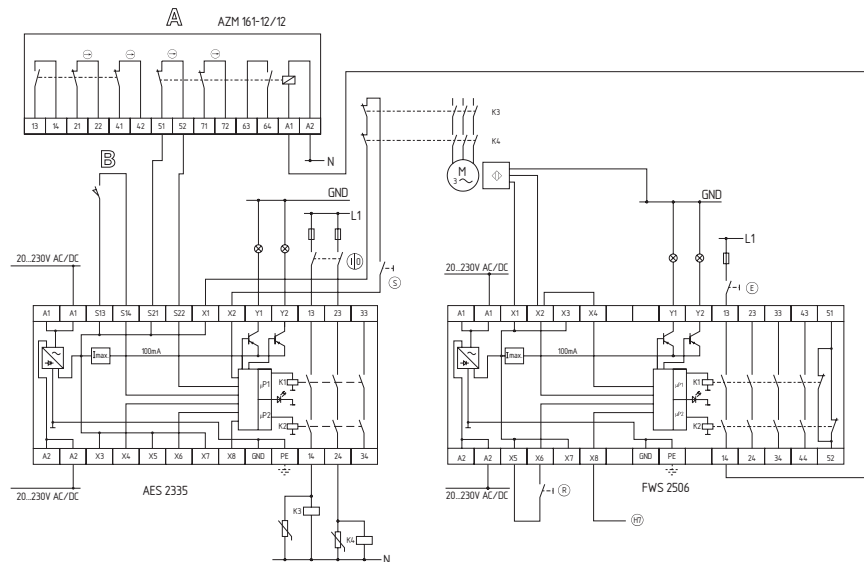
Authorized operation, enabling paths closed
Fault

Standstill monitoring

Note

- FWS to monitor one guard door at plants with dangerous run-on movements up to control category 3 to EN 954-1
- Standstill monitoring for unlocking solenoid interlocks
- The solenoid interlock can be opened, when the standstill monitor has detected the end of the run-on movement by means of one or two inductive proximity switches. When the button  is actuated, the solenoid of the solenoid interlock is energised.
- If only one inductive proximity switch is connected to the standstill monitor, the standstill frequencies must be identical and inputs X2 and X4 must be bridged
- For suitable IFL range p-type inductive proximity switches, refer to "Schmersal Catalogue Automation technology".

Wiring diagram



ISD

The following faults are recognised by the safety monitoring module and indicated by the ISD

- Interruption of the connections to the inductive proximity switches
- Failure of proximity switches
- Failure of one channel being evaluated
- Failure of safety relay to pull-in or drop-out
- Faults on input or relay control circuits of the safety monitoring module

Note

The wiring diagram is shown with guard doors closed and in de-energised condition.

The ISD tables (Integral System Diagnostics) for analysis of the fault indications and their causes are shown in the appendix.









ISD - Integral System Diagnostics

Fail-safe standstill monitors FWS

The fail-safe standstill monitors LED display to show the different switching conditions and faults. The tables show the different switching conditions.

LED lights up green	<ul style="list-style-type: none"> Enabling paths are closed
LED flashes yellow (2 Hz)	<ul style="list-style-type: none"> Motor running, the limit frequency is exceeded, the enabling paths are open
LED flashes yellow (0,5 Hz)	<ul style="list-style-type: none"> With two proximity switches connected, only one switch is below the limit frequency, the enabling paths are open

By fault messages, the LED lights up orange in intervals. During these intervals the LED flashes in short pulses from one to eight times.

Display (orange)	Fault	Cause
LED 1 pulse 	<ul style="list-style-type: none"> Sensor 1 frequency too low Input X1, only for FWS 1205/1206 Input X2, only for FWS 2105/2106/2505/2506 Input X3, only for FWS 2316 	<ul style="list-style-type: none"> Defective incoming connection or defective proximity switch
LED 2 pulses 	<ul style="list-style-type: none"> Sensor 2 frequency too low Input X2, only for FWS 1205/1206 Input X4, only for FWS 2105/2106/2505/2506 Input X5, only for FWS 2316 	<ul style="list-style-type: none"> Defective incoming connection or defective proximity switch With only one proximity switch, jumper X1/X2 missing, only for FWS 1206
LED 3 pulses 	<ul style="list-style-type: none"> Cross-wire monitoring, only for FWS 2316 	<ul style="list-style-type: none"> One or both proximity switches supply no output voltage: Proximity switch defective, not mounted or leads interrupted, only for FWS 2316 Cross-wire monitoring of the proximity switches, only for FWS 2316
LED 4 pulses 	<ul style="list-style-type: none"> Fault signals on the inputs, no safe evaluation 	<ul style="list-style-type: none"> Too high capacitive or inductive coupling on the inputs or incoming power supply leads
LED 5 pulses 	<ul style="list-style-type: none"> One or both relays not pulled in within a monitored time 	<ul style="list-style-type: none"> Operating voltage U_e too low Defective relay
LED 6 pulses 	<ul style="list-style-type: none"> Relay not dropped out on actuation of switch 	<ul style="list-style-type: none"> Welded relay contact
LED 7 pulses 	<ul style="list-style-type: none"> Fault signals on internal data connections 	<ul style="list-style-type: none"> Fault on the internal data transmission due to excessive capacitive or inductive coupling on the internal data connections
LED 8 pulses 	<ul style="list-style-type: none"> Additional standstill signal, only for FWS 1206/2106/2506 	<ul style="list-style-type: none"> The condition of the additional standstill signal does not correspond to the detected frequencies, e.g. the additional signal shows standstill but the proximity switch indicates limit frequency exceeded

* Partial actuation

Switch position in which only one contact has been actuated.

Deletion of fault indication

The fault indication is deleted when the error cause has been eliminated and the AES could check all the functions.

In case of a fault of switch 1 or switch 2, the appropriate switch must be actuated (open and re-close safety guard).

For all other faults, both switches must be actuated.