Monitoring Technique

VARIMETER
Speed Monitor
BA 9055, AA 9050

Translation
of the original instructions

Replacements:
MK 9055N, MH 9055

DOLD

0225072


BA 9055


AA 9050

- According to IEC/EN 60255-1
- Detection of
  - Underspeed
  - Overspeed
  - Standstill
- Adjustable response value
- BA 9055 with adjustable start-up delay
- AA 9050 with adjustable hysteresis
- Width 45 mm

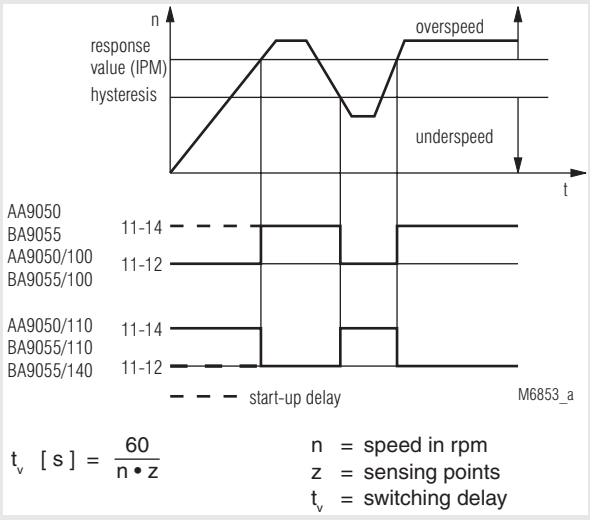
Product Description

The speed monitors BA 9055 and AA 9050 monitors the rotational speed of motors. They recognise and monitor impulse signals of proximity sensors and protect machines and produced material or allows speed depending switching in production processes.

Approvals and Markings

CE

Function Diagram



t_v [s] = $\frac{60}{n \bullet z}$

n = speed in rpm
z = sensing points
t_v = switching delay

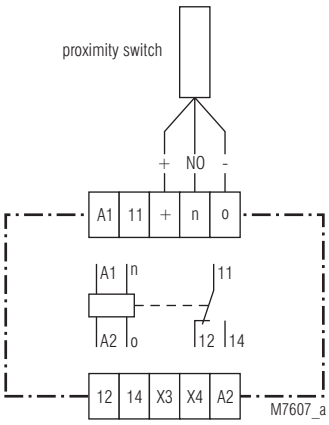
Applications

Speed monitors are used in case where it is necessary not to exceed certain speed limits in order to protect plants and products against damage. The Speed monitors are used on conveyors, transfer lines as well as plants where several drives with a certain speed have to work together.

Function

The measuring principle is to compare frequencies. With a proximity sensor the speed is converted to a speed proportional frequency. This frequency is compared to an internal adjustable frequency reference. If the measured frequency is higher then the reference the output relay is energized on an underspeed monitor or de-energized on an overspeed monitor. The output relay deenergises on an underspeed monitor if the speed goes under the setted hysteresis value. On the overspeed monitor the relay is energized. The reaction time is rather short, as the unit has no intergrating function. To calculate refer to formula in Function Diagram. The power supply for the proximity sensor is built into the unit. The input is designed for pnp sensors. The speed monitor has an integrated start-up delay. The unit is delivered with a bridge between terminals X3-X4. The start-up delay is activated when the power supply is connected to A1-A2.
For the start- up time the output relay is energized. If no start-up delay is required, the bridge must be removed. The start-up delay can be activated also by external contacts connected to X3-X4.
The start-up delay normally is not required with overspeed monitoring. An LED indicates the connected power supply. A second LED indicates the state of the output relay.

Circuit Diagram



BA 9055.11, AA 9050.11

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
+, o	Current supply proximity sensors
n	Measuring input
X3, X4	Programming terminals
11, 12, 14	Speed indicator relay (two-way contact)

Technical Data

Input Circuit

Input:	For proximity sensors, built in power supply DC 24 V, max. 40 mA
Setting range:	0.05 ... 0.5 lpm 10 ... 100 lpm 0.1 ... 1 lpm 50 ... 500 lpm 0.5 ... 5 lpm 100 ... 1 000 lpm 1 ... 10 lpm 500 ... 5 000 lpm 5 ... 50 lpm 1000 ... 10 000 lpm lpm = Impuls per minute
Min. pulse length:	1 ms
Max. frequency:	30000 lpm
Setting:	Infinite on relative scale
Setting accuracy:	≤ ± 3 %
Response value:	0.1 ... 1 of end of scale value
Hysteresis:	
BA 9055:	2 % of response value
AA 9050:	2 ... 30 % of response value
Accuracy:	≤ ± 1 %
Temperature influence:	≤ ± 0.1 % /°C
Influence of auxiliary supply:	< ± 0.5 % at 0.9 ... 1.1 U_N
Start up delay	
BA 9055:	1 ... 20 s
AA 9050:	10 s (up to 60 min. available)

Auxiliary Circuit

Auxiliary voltage U_H:	AC 24, 110, 127, 230, 240 V DC 24 V
Voltage range of U_H:	
AC:	0.8 ... 1.1 U_H
DC:	0.9 ... 1.2 U_H
Nominal consumption:	< 4 VA
Nominal frequency of U_H:	50 / 60 Hz

Output Circuit

Contacts:	1 changeover contac
Thermal current I_{th}:	6 A
Switching capacity	
To AC 15:	5 A / AC 230 V IEC/EN 60947-5-1
Electrical life	
At 6 A, AC 230 V cos φ = 1:	> 2 x 10^5 switch. cycl. IEC/EN 60947-5-1
Permissible switching frequency:	6000 switching cycles / h
Short circuit strength max. fuse rating:	4 A gG / gL IEC/EN 60947-5-1
Mechanical life:	> 30 x 10^6 switching cycles

General Data

Operating mode:	Continuous operation
Temperature range	
Operation:	- 20 ... + 60°C
Storage:	- 20 ... + 60°C
Altitude:	≤ 2000 m
Clearance and creepage distances	
Rated impulse voltage / pollution degree:	4 kV / 2 IEC 60664-1
EMC	
HF-irradiation	
80 MHz ... 2,7 GHz:	10 V / m IEC/EN 61000-4-3
Fast transients:	2 kV IEC/EN 61000-4-4
Surge voltages	
Between	
wires for power supply:	1 kV IEC/EN 61000-4-5
Between wire and ground:	2 kV IEC/EN 61000-4-5
HF-irradiation:	10 V IEC/EN 61000-4-6
Interference suppression:	Limit value class B EN 55011
Degree of protection	
Housing:	IP 40 IEC/EN 60529
Terminals:	IP 20 IEC/EN 60529
Housing:	Thermoplastic wiht V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm, frequency 10...55Hz, IEC/EN 60068-2-6
Climate resistance:	20 / 060 / 04 IEC/EN 60068-1
Terminal designation:	EN 50005
Wire connection:	2 x 2.5 mm^2 solid or 2 x 1,5 mm^2 stranded wire with sleeve DIN 46228-1/-2/-3/-4
Stripping length:	10 mm

Technical Data

Wire fixing:	Flat terminals with self-lifting clamping piece IEC/EN 60999-1
Screw mounting	
AA 9050:	35 x 50 mm and 35 x 60 mm
Fixing torque:	0.8 Nm
Mounting:	DIN rail IEC/EN 60715
Weight:	
BA 9055:	410 g
AA 9050:	400 g

Dimensions

Width x height x depth	
BA 9055:	45 x 74 x 124 mm
AA 9050:	45 x 77 x 127 mm

Classification to DIN EN 50155 for BA 9055

Vibration and shock resistance:	Category 1, Class B IEC/EN 61373
Protective coating of the PCB:	No

Standard Type

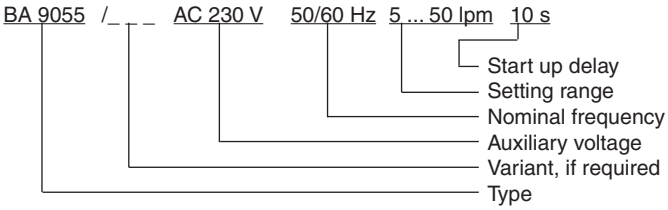
BA 9055 AC 230 V 50/60 Hz 10 ... 100 lpm 1 ... 20 s

Article number:	0030731
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 230 V
• Setting range:	10 ... 100 lpm
• Width:	45 mm

Variants

BA 9055, AA 9050:	Standstill and underspeed monitoring with start up delay, closed circuit operation overspeed monitoring with start up delay, open circuit operation
BA 9055/100, AA 9050/100:	Standstill and underspeed monitoring without start up delay, closed circuit operation overspeed monitoring without start up delay, open circuit operation
BA 9055/110, AA 9050/110:	Standstill and underspeed monitoring without start up delay, open circuit operation overspeed monitoring without start up delay, closed circuit operation
BA 9055/140:	Standstill and underspeed monitoring with start up delay, open circuit operation overspeed monitoring with start up delay, closed circuit operation

Ordering example for variants



Accessories

K 70-34:	Cover for AA 9050 Article number: 0011790
NA 5001, NA 5002, NA 5005, NA 5010:	Initiators (Proximity Sensors), inductive

For further information on the initiators, please refer to the associated NA 5001 data sheet at www.dold.com.