

INT[®]69 YF Diagnose



Application

The motor protector INT69 YF Diagnose is a universal and versatile protection unit. For the monitoring of electrical components, various inputs for temperature, voltage, leakage/resistance measurement and analog signals are available in a single module. Protective functions and behavior can be flexibly adjusted to the application by parameterization.

The INT69 YF Diagnose saves operating and error data in a non-volatile memory. This data can be read and evaluated for diagnosis. This motor protector is mainly used for protecting pumps.

Functional description

All monitoring functions can be configured by simple parameterization via the app. The following operating statuses of the inputs are described as active, but can be deactivated via parameterization.

The temperature monitoring takes place according to the static evaluation process of a PTC, a PT100 or a PT1000. The monitoring of a PTC sensor switches off the alarm relay immediately when the nominal response temperature is reached. The monitoring of a PT100 and PT1000 switches off the alarm relay or the warning relay when the adjustable temperature limits are reached, after the adjustable activation delay has elapsed.

A short circuit or an open circuit at a temperature input also causes a switch-off of the alarm relay.

The temperature monitoring of the motor winding can also take place according to the static evaluation process of a bimetal switch; when the bimetal switch opens, the alarm relay is switched off without delay.

The phase monitoring of the motor voltage is active from 6 s after the start of the motor.

The correct phase sequence is monitored for 5 s. Phase failure, phase asymmetry, under- and overvoltage are monitored during the entire motor running time.

If there is an incorrect phase sequence, the motor protector switches off in a locked state.

The alarm relay or warning relay also switches off in the event of phase asymmetry or failure, and also in the event of undervoltage or overvoltage after the adjustable limits have been reached and after the adjustable activation delay has elapsed.

The phase monitoring is deactivated for approx. 2 s after motor stop in order to prevent unwanted locking caused by temporary reverse running of the machine.

The leakage monitoring takes place according to the static evaluation process of an ohmic resistor.

The monitoring of an ohmic resistance switches off the alarm relay or the warning relay when the adjustable limits are reached, after the adjustable activation delay has elapsed.

The analog signal monitoring takes place according to the static evaluation process of a current.

When the adjustable limits are reached, the alarm relay or the warning relay is switched off after the adjustable activation delay has elapsed.

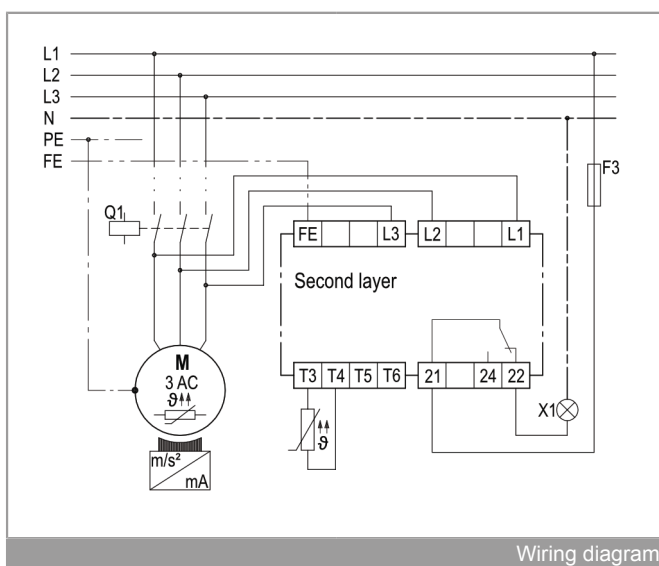
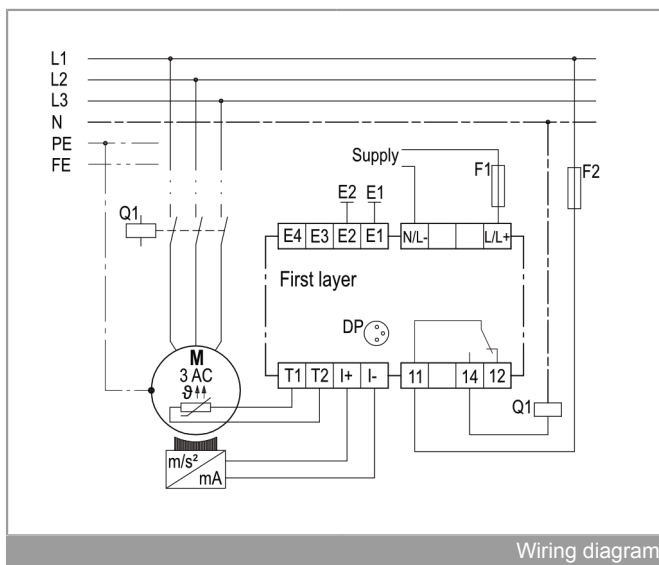
The closed-circuit current of the analog signal is adjustable and additionally monitored.

The switching frequency monitoring records switching operations per time range.

When the adjustable number of switching operations within the adjustable time range is exceeded, the alarm relay or the warning relay is switched off.

The INT69 YF Diagnose monitors the given module and supply voltage and generates a warning via the diagnostics interface as soon as this sinks beneath a specified limit value.

After rectifying the error and subsequent reset delay, the system is switched on again.



Restart after a lock-out is only possible after a reset.

Settable parameters (see parameter table) can be set via the diagnostics port with the help of the INTspector app, and with separately available accessories.

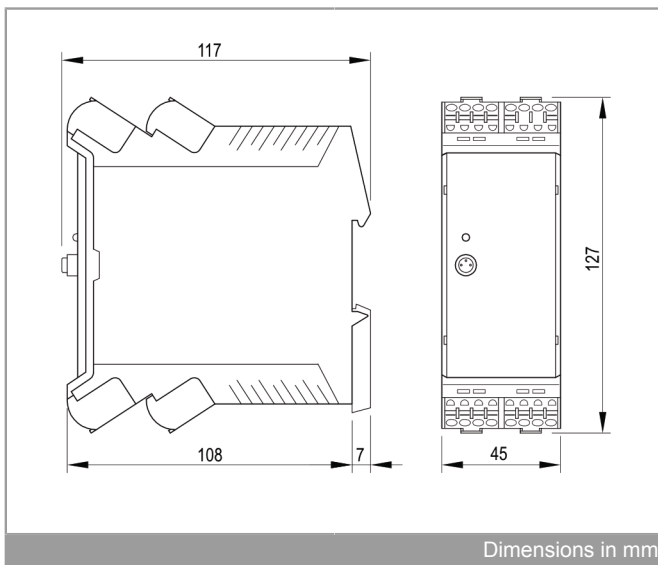
The integrated LED signals the current status of the motor protector (see blink code).

In case of error-free operation, the built-in LED lights up green. The alarm relay and the warning relay are activated. If an error or warning is detected, the alarm or warning relay is deactivated. The two output relays operate in closed-circuit current mode.


The INT69 YF Diagnose has a service interval function. The adjustable interval time is activated when the service interval is restarted. After the time has elapsed, the service is signaled via the built-in LED.

The INTspection memory records all measured values for the adjustable time range. If an error occurs, the measured values are made available for the time range during, before and after the time of the error.

In order to guarantee the function of the INT69 YF Diagnose, the functional earth must be connected.





Safety instructions

 Installation, maintenance, and operation are to be carried out by an electrician.

The applicable European and national standards for connecting electrical equipment must be observed.

Connected sensors and connection lines that extend from the switching cabinet must feature at least a basic insulation.

 The circuit of the DC supply in which the is located must be earthed. If this is not the case, all connected devices must have at least a basic insulation.

 To achieve the specified overvoltage category, sensors must have at least double insulation in the motor winding.

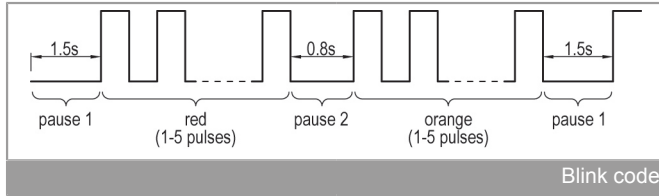
Order data

INT69 YF Diagnose	20 A 701 P081
Further product information	See www.kriwan.com

Blink code

The KRIWAN blink code enables fast and simple status display and troubleshooting.

The blink code consists of a cyclical blinking sequence. In the event of an error, the blinking sequence consists of red and orange pulses. If warnings are pending, the sequence consists of green and orange pulses. The current status can be determined from the number of blinking pulses.



Overview of blink code

Green lit	Machine ready for operation
Green blinking	Machine running
Green / Orange blinking	Warning, machine in critical range, for description see below
Red / Orange blinking	Error, machine is switched-off, for description see below

1. Blinking sequence (LED red)	2. Blinking sequence (LED orange)	Description
1	1	Motor temperature: Static switch-off, permissible winding temperature exceeded
1	2	Motor temperature: Sensor input detected open circuit or short circuit
2	1	Phase monitoring: Incorrect phase sequence
2	2	Phase monitoring: Phase failure/asymmetry
2	3	Phase monitoring: Undervoltage/overvoltage
3	1	Temperature input 1: Static switch-off / warning, permissible temperature exceeded
3	2	Temperature input 2: Static switch-off / warning, permissible temperature exceeded
3	4	Temperature input 1: Sensor input detected open circuit or short circuit
3	5	Temperature input 2: Sensor input detected open circuit or short circuit
4	1	Leakage 1: Static switch-off / warning, permissible limit value undercut / exceeded

1. Blinking sequence (LED red)	2. Blinking sequence (LED orange)	Description
4	3	Leakage 2: Static switch-off / warning, permissible limit value undercut / exceeded
5	1	General: Internal error
5	2	General: Supply voltage too low
5	3	General: Current loop static switch-off / warning, permissible limit value undercut / exceeded
5	4	General: Current loop sensor fault detected, closed-circuit current undercut
5	5	General: Switching frequency static warning, permissible switching operations exceeded

Technical specifications

Supply voltage	AC/DC 50/60 Hz 24 V ±10 % 9 VA
Permissible ambient temperature T _A	-30...+70 °C
Temperature measuring circuit	
– Type	1-2 AMS sensors in series alternative 1-9 PTC sensors according to DIN 44081, DIN 44082 in series
– R ₂₅ , total	<1.8 kΩ
– R _{activate} , static	4.5 kΩ ±20 %
– R _{reset}	2.75 kΩ ±20 %
– Max. length of connection line	30 m
– Short circuit monitoring	<20 Ω
– Open circuit monitoring	>20 kΩ
Temperature measuring circuit	
– Type	Pt100
– Measuring range	-50... +300 °C
– Resolution	1 K
– Accuracy	5% of measuring range maximum value
– Short circuit monitoring	<20 Ω
– Open circuit monitoring	>400 Ω
Temperature measuring circuit	
– Type	Pt1000
– Measuring range	-50... +300 °C
– Resolution	1 K
– Accuracy	5% of measuring range maximum value
– Short circuit monitoring	<20 Ω
– Open circuit monitoring	>2.3 kΩ
Switching input	
– Type	Potential-free switch (digital input)
– Contact suitable for	DC 24 V, 20 mA
– Max. length of connection line	30 m
Leakage measuring circuit	
– Type	Resistance measurement between electrode pair
– Measuring range	10 k...1 MΩ
– Resolution	1 kΩ
– Accuracy	±10% of measuring range maximum value within range 10 k...100 kΩ ±25% of measuring range maximum value within range 101 k...1 MΩ
Analog input	
– Type	0...20 mA / 4...20 mA current signal
– Provided voltage	DC 24 V +5% -25%
– Measuring range	0...20 mA
– Resolution	0.1 mA
– Accuracy	2.5% of measuring range maximum value
– Max. length of connection line	30 m

Phase monitoring	
– Operation with frequency converter	Suitable
– Measuring range phase- phase	3 AC 20...100 Hz 100...690 V ±10%
– Operating frequency range	1...16 kHz
– Typ. operating frequency	8 kHz
– min. time for detection	100 ms
– Monitoring options	Phase sequence, phase failure, phase asymmetry, undervoltage and overvoltage
Switching frequency monitoring	Switching operations per time unit, configurable
Switch-off limits, general	Configurable unless specified otherwise
Reset delay	Configurable
Reset of the lock or the reset delay	Power reset >5 s only possible when error no longer present
Relay	
– Contact	AC 240 V 2.5 A C300 Mind. AC/DC 24 V 20 mA
– Mechanical service life	Approx. 1 million switching oper- ations
Interface	Diagnostics port (DP)
Protection class according to EN 60529	IP20
Connection type	Tension spring connection (PUSH-IN) 0.2...2.5 mm ²
Housing material	PA 66 GF 30
Mounting	Switching cabinet housing (basic grid 45 mm), can be snapped onto 35 mm standard rail according to EN 60715
Dimensions	See dimensions in mm
Weight	Approx. 300 g
Testing basis	EN 61000-6-2, EN 61000-6-3 EN 61010-1 Overvoltage category III (observe insulation of the temperature sensor) Pollution level 2

Parameter table

Parameter name	Adjustment range			Unit
	Min	Max	Default	
Motor temperature 1				
– Sensor type	Deactivated	PT100	PT100	
– Switch-off temperature	-100	300	140	°C
– Warning temperature	-100	300	110	°C
– Hysteresis	0	300	30	K
– Activation delay	0.1	3600	0.1	s
– Reset delay	0	Locked	Locked	s
– Line correction	0	100	0	Ω
Temperature 1				
– Sensor type	Deactivated	PT1000	PT1000	
– Switch-off temperature	-100	300	60	°C
– Warning temperature	-100	300	40	°C
– Hysteresis	0	300	10	K
– Activation delay	0.1	3600	0.1	s
– Reset delay	0	Locked	Locked	s
– Line correction	0	100	0	Ω
Temperature 2				
– Sensor type	Deactivated	PT100	Deactivated	
– Switch-off temperature	-100	300	60	°C
– Warning temperature	-100	300	40	°C
– Hysteresis	0	300	10	K
– Activation delay	0.1	3600	0.1	s
– Reset delay	0	Locked	Locked	s
– Line correction	0	100	0	Ω
Leakage 1				
– Operating mode	Deactivated	Resistance undercut	Resistance undercut	
– Switch-off value	1	1000	50	kΩ
– Warning value	1	1000	70	kΩ
– Hysteresis	1	999	10	kΩ
– Activation delay	0.1	3600	0.5	s
– Reset delay	0	Locked	Locked	s
Leakage 2				
– Operating mode	Deactivated	Resistance undercut	Deactivated	
– Switch-off value	1	1000	50	kΩ
– Warning value	1	1000	70	kΩ
– Hysteresis	1	999	10	kΩ
– Activation delay	0.1	3600	0.5	s
– Reset delay	0	Locked	Locked	s
Analog input 1				
– Operating mode	Deactivated	Limit value undercut	Deactivated	
– Closed-circuit current	0 = Deactivated	19.9	4.0	mA
– Switch-off value	0.1	19.9	15.0	mA
– Warning value	0.1	19.9	10	mA
– Hysteresis	0.1	19.9	1,0	mA
– Activation delay	0.1	3600	0.5	s
– Reset delay	0	Locked	Locked	s
– Minimum value conversion	-500.0	5999.9	4.0	
– Maximum value conversion	-499.9	6000.0	20.0	
– Conversion unit character 1 & 2	0	65535	27969	
– Conversion unit character 3 & 4	0	65535	8224	
– Analog input 1 activation delay	0.5	6553.5	3	s

Parameter name	Adjustment range			Unit
	Min	Max	Default	
Phase monitor 1				
– Phase monitor operating mode	Deactivated	Active	Active	
– Voltage referencing	Phase-Neutral	Phase-Phase	Phase-Neutral	
– Phase failure switch-off value	0	100	75	%
– Phase failure reset delay	0	Locked	Locked	s
– Phase sequence operating mode	Deactivated	Active	Active	
– Phase asymmetry switch-off value	1	100	15	%
– Phase asymmetry warning value	1	100	10	%
– Phase asymmetry hysteresis	1	99	5	%
– Phase asymmetry activation delay	0.1	360	0.3	s
– Phase asymmetry reset delay	0	Locked	Locked	s
– Undervoltage operating mode	Deactivated	Limit 1 warning	Deactivated	
– Undervoltage limit 1	100	690	207	V
– Undervoltage limit 2	100	690	195	V
– Undervoltage hysteresis	1	600	20	V
– Undervoltage limit 1 activation delay	0.1	360	3.0	s
– Undervoltage limit 2 activation delay	0.1	360	3.0	s
– Undervoltage reset delay	0	Locked	Locked	s
– Overvoltage operating mode	Deactivated	Limit 1 warning	Limit 1 warning	
– Overvoltage limit 1	0,1	690	253	V
– Overvoltage limit 2	100	690	265	V
– Overvoltage hysteresis	1	600	20	V
– Overvoltage limit 1 activation delay	1	360	3.0	s
– Overvoltage limit 2 activation delay	0.1	360	3.0	s
– Overvoltage reset delay	0	Locked	Locked	s
Switching frequency				
– Operating mode	Deactivated	Warning	Deactivated	
– Reset delay	0	Locked	Locked	s
– Switching per time range	2	10	3	
– Time range	1	43200	30	s
INTspection Memory				
– Basic time grid, range 1	1	3600	1	s
– Time factor, range 2	1	3600	60	
– Time factor, range 3	1	3600	60	
– INTspection memory error offset	1	100	100	
– Evaluation, measurement value 1	Minimum	Maximum	Average value	
– Evaluation, measurement value 2	Minimum	Maximum	Average value	
– Evaluation, measurement value 3	Minimum	Maximum	Average value	
– Evaluation, measurement value 4	Minimum	Maximum	Average value	
– Evaluation, measurement value 5	Minimum	Maximum	Average value	
– Evaluation, measurement value 6	Minimum	Maximum	Average value	
– Evaluation, measurement value 7	Minimum	Maximum	Average value	
– Evaluation, measurement value 8	Minimum	Maximum	Average value	
– Evaluation, measurement value 9	Minimum	Maximum	Average value	
– Evaluation, measurement value 10	Minimum	Maximum	Average value	