Accessories

External Memory Module (Part number: FPR0467)

The external, pluggable memory module stores the relay setting, logic function settings and starter configurations. The memory module is updated by the relay each time any of these settings are changed via the frontend software or door mounted MMI. The module is intended to aid field maintenance personnel in the setup of a replacement relay should a relay need to be changed.

Insulation Lock-out Module (Part number: FPR0468)

The insulation resistance of the motor is measured while in a static (not in service) condition. If the resistance drops below 20 kilo ohms, the relay will trip and prevent a start-up.

Expanded I/O Module (Part number: FPR0469)

This is an expansion module with 4 programmable output relays and 8 digital inputs (all with LED status indication). The unit connects to the relay via a T-Bus connector and derives power from the relay's own power supply.

RTD Expansion Module (Part number: FPR0470)

This is an expansion module with 4 RTD inputs which can accept a NTC, PTC, PT100 or PT1000 input. The unit connects to the relay via the T-Bus connector and derives power from the relay's own power supply.

4-20 mA Module (Part number: FPR0471)

This is an expansion module with 2 input loops and 2 output loops for 4-20 mA signals. Running amps or thermal capacity, or any analog signal, can be sent out though the output loops. Similarly, any analog input can be sent to the ProBeck-IPS relay for control purposes.

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Ordering information

ProBeck-IPS Motor Protection Relay	Product Code
ProBeck-IPS MP Relay - Profibus	FPR0450
ProBeck-IPS MP Relay - Modbus	FPR0451
ProBeck-IPS MP Relay - DeviceNet	FPR0452
ProBeck-IPS MP Relay - EtherNet	FPR0453
ProBeck-IPS CTMB 1Amp 110-550Volt	FPR0455
ProBeck-IPS CTMB 5Amp 110-550Volt	FPR0456
ProBeck-IPS CTMB 25Amp 110-550Volt	FPR0457
ProBeck-IPS CTMB 50Amp 110-550Volt	FPR0458
ProBeck-IPS CTMB 100 Amp 110-550Volt	FPR0459
ProBeck-IPS CTMB 300 Amp 110-550Volt	FPR0460
ProBeck-IPS-CTMB-CABLE-1000-1m	FPR0462
ProBeck-IPS-CTMB-CABLE-500-500mm	FPR0463
ProBeck-IPS-CTMB-CABLE-300-300mm	FPR0464
ProBeck-IPS-CTMB-CABLE-100-100mm	FPR0465
ProBeck-IPS-I2C Settings Memory Module	FPR0467
ProBeck-IPS-Insulation Lockout Module	FPR0468
ProBeck-IPS-I/O Expansion Module 8I/40	FPR0469
ProBeck-IPS-RTD Module 4 Input	FPR0470
ProBeck-IPS 4-20mA Module 2 In X 2 Out	FPR0471
ProBeck-IPS Pilot Wire PW-TLM Controller	FPR0472





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About

The ProBeck-IPS Relay is an ISO 9001:2000 compliant, locally designed and manufactured, three-phase motor protection relay. It is a micro-controller based precision instrument with protection, advanced control features and starter logic. The relay is designed to cater for the low voltage motor protection market. The current transformers, including the core balance current transformers are external.

Protection Features:

Thermal Overload Locked Rotor Running Stall – Jam Vectorial Stall – Start Stall Unbalanced Current Single Phasing Minimum Load – Underload - Dry Run Earth Leakage Earth Fault Short-circuit Starts per Hour Limitation Overvoltage – Undervoltage Phase Rotation Over Frequency – Under Frequency Insulation Lock-out

Management Features:

Power Factor Measurement Power Consumption Measurement Statistical Data 1400 Event Records with time and date stamp 35 Last Fault Records with time and date stamp

Configurable Automation Features:

Timers Real Time Clock (24 Hour) Starter Controller Logic Logic Function Blocks 7 Field Inputs Motor Parameter Calculator 4 Programmable Outputs 3 Phase Recorder On-board Simulator for Training / Commissioning Multiple Communication Protocols







The ProBeck-IPS relay is fully configurable with the aid of frontend software or a man machine interface unit (MMI). Event records can also be downloaded with the aid of the laptop for further analysis. All the settings are password protected. The relay has an onboard database where time and date stamped records are kept. Two types of records are kept namely fault records (35 last faults) and event records (1400 events). In the case of event records, the user has limited access rights (read only).

The front-end also has a data recorder and a spectrum analyser which could be used to analyse motor performance and supplied power quality respectively. The spectrum analyser can detect harmonics up to the 9th harmonic on any of the three phase currents.

The relay detects earth leakage currents with the aid of the external core balance current transformer and is configurable to operate in inverse definite minimum time (IDMT) or instantaneous definite time (IDT) mode. A unique feature is added to the relay in the form of simulation. This function could be used for personnel training or relay functionality testing.

Dimensions





Electrical Connection Diagrams for 4-20 mA and RTD Modules





ProBeck-IPS Current module dimensions for 100 and 300 Amps



ProBeck-IPS Current module dimensions for 5, 10, 25 and 50 Amps



Technical Specifications

Auxiliary Power Supply Voltage requirements Power requirements

: 110 - 230 V AC/DC : 2,5 Watt

Operating Environment Temperature Relative humidity

: -20°C - 65°C : < 85%

Communication Protocols Profibus DPV-1, Modbus, CanBus

Input Converter Class Rating Frequency Response

: Class 1 : 0.1 VA 40 to 66 Hz

Overload Trip Delay Curves Class 3 - 40 to IEC 60255-8 Specification

Unbalance / Single Phasing Setting Level Setting Trip Delay

: 5 – 50% le (M.F.L.) : 1 to 10 seconds

Underload Detection Range Trip Delay Priming Time Available Power Factor Setting

: 10 to 100% of Max Load Setting : 1 to 10 seconds : 1 to 200 seconds : 0.1 to 1 on Minimum Load Setting

Auto Reset Limiter Auto Reset limited to only 3 times per hour

Maximum Load Current Setting Level Setting Accuracy : ± 2% Linearity : ± 2% Repeatability :±1% Detection Level : ± 2% Calibration : Amps

> : 5 Amps 220 V AC Form C (Common, NC / NO)

Fault Indication Operation

4X Output Relays

Configuration

Fully configurable

: Latch LED on Trip, record on event and fault records : Clear LED on Resetting

Running Stall Protection Detection Level Trip Delay Adjustable

: 110 to 300% of Max Load : 0.100 - 1 second

Three phase current measurement Range Dynamic range

: 1 – 400 Amps : 0% to 1000%

: 110 V, 380 V, 400 V, 525 V, 550 V, 680 V, 950 V, 1100 V, 3 K 3 V /

Range selection

Voltage Range

110 V, 6 K 6 V / 110 V, 11 KV / 110 V : manual or automatic selection at power up

Earth Leakage Range Trip Time

: 30 mA to 3 Amps : Inverse Definite Minimum Time (IDMT) and Instantaneous Definite Time (IDT)

Real Time Clock 24hr clock (year, month, day, hours and minutes) Battery back-up (5 days) Time & date stamping (fault and event records) Insulation Resistance Measurement range : 1 to 99 kOhm Resolution : 1 kOhm

Power Factor Range

Thermal Curves



Standards compliance and certifications

ISO 9001:2008	Quality management
CISPR 22:1-15	Radiated emissions
CISPR 22:1-15	Conducted emissions
	(Power Leads)
IEC 61000-4-2:	Electrostatic discharge
	immunity test
IEC 61000-4-3:	Radiated, radio-frequency,
	electromagnetic field immunity test
IEC 61000-4-4:	Electrical fast transient / burst
IEC 61000-4-5:	Surge immunity test
IEC 61000-4-6:	Immunity to conducted
	disturbances, induced by
	radio-frequency fields
IEC 61000-4-11:	Voltage dips
IEC 61000-3-2:	Harmonic current emissions
IEC 61000-3-3:	Voltage changes, voltage
	fluctuations and flicker

Frontend Actual Readings

Options Discon	wet						
Test Actual	Event History Settings	Calculator Control Logic	Spectrum Analyser Starter Configuration	Info Real Time Clock	External Modules Fault History	Comms + Statistics	Recorde
Unique	Drive ID : PumpSum		NE	Yec.	Drive Descript	ion : (878-SP20-MC33	
Thermal Curve Thermal Trip Tin	Class Setting 15 and in Remainder Infinite sec	40 50 6	0 70 30	1 70 80 90 100	150 200 250	In Service (Motor Runn Phase Voltages Pres	ingl 🔽
Red Phase I White Phase I	Current Level 79 %	10 TC	90 20 10 1 100 10 1 4 2 1 load max	100 110 120 20 20 20 20 20 20 20 20 20 20 20 20 2	0 V 400	Line Voltage Selection Actual Line Voltage (max) Actual Phase Current Level	529V 523 V 33.97 A
Blue Phase (Cuver	Cusent Level 72 % # Unbalance 7 %	Ø Zero	Analog Signals	0 Crits	Current Trends	Supply Frequency Selection Actual Frequency	50Hz
Red Phase V White Phase V	Vollage Level 302 V Vollage Level 302 V	RTD 1 56 RTD 2 6	T ^o C Input 2	Õ Crite	1	Actual Power Factor	78 %
Volta	ge Symmetry 100 %	RTD 3 9	5 °C Butput 2	õ Crita		Motor Total Running Hos	urs 600
Apparent Power Real Power	Dissipation 30.8 kVA	Trip Reset	Earth Lookage Cunert	17 mA Se	Firmware Rev 2c	Model NC 50 3 Interposing 1:1	Relay Colo MTR RL 1
Alam and Trip I Diverci Vectorial Run Current Linbal Single P Minimum Low Frequ High Frequ	Flags Stat 2000 Stat 2000 Stat 2000 Stat 2000 Stat 2000 Stat 2000 Stat 2000 Stat 2000 Exempt 2000 Flags Stat 2000 Stat 2000 St	Short Circuit Overvoitage Indervoitage ge Symmetry fion Lockout th Leokage Earth Fauk Earth Fauk	Voltage Phase F Stats per H System Stat R1 Analog Sign	Totation and the second	PLC Inputs 9 0 1 1 10 0 2 0 11 0 3 1 12 0 4 1 12 0 5 0 14 0 6 1 15 0 7 0 16 0 8 0	Digital Field Inputs Input 1 Input 2 Input 4 Input 4 Input 5 Input 6 Input 7	RL2 RL3 RL4

Frontend Settings

ions Disconnect					12/0	
Test Event History chual Settings	Calculator Control Logic	Spectrum Analyser Starter Configuration	Info Real Time Clock	External Modules Fault History	Commi + Statistics Recorder	
arameter Settings and Feature Set	lection					
Anances Settings and Feature Selection Unbelance Phase Current Trip Defay T0 ± sec Trip Level T0 ± x Voltage Lev Voltage Selector 5297 ▼ Figh Lev T0 ± x Low Level T0 ± x Voltage Selector 5297 ▼ Figh Level T0 ± x Low Level T0 ± x Voltage Selector 5297 ▼ Starter Tope Selection Description Select Phase Connected Example Connectage Select Default Example Select Default Selector 5296 T term Node Connected FIED C		Minimum Lead Restar Deby Under Current Trip Le Power Factor Trip Le Statue Trip De Runn-Stall Trip Hokturf Del Digital Field Input De	Manual w rol 35 \$\$ \$\$ rol 45 \$\$ \$\$ rol 45 \$\$ \$\$ rol 10 \$\$ \$\$ rol 45 \$\$ \$\$ rol 10 \$\$ \$\$ rol 10 \$\$ \$\$ rol 45 \$\$ rol 10 \$\$ \$\$	Mater Full Last Schling Mile Image: Schling MLC Image: Schling		
		leput 1 100	Input 5 100			
		bolance Select al Select beloct tall Select telest when Manual Select ways Filer Select CF.Rr. Thold: Adj Select then Select	Frequency Monito	king Select kot Kon kot sot	Analog Input 1 Select Analog Input 2 Select Analog Output 1 Select Analog Output 2 Select Reads settings Itom relay Transmit settings to relay	

Starter Configuration

est Event History	Calculator Spectru	m Analyser Info	External Modules	County Contains December		
Actual Sentrops Control Logic State Col State Col Faid (npd) Location Selector OperAding of the Col OperAding of the Col OperAding of the Col Paid (npd) Paid (npd) </th <th>Starter Type Direct On Line Reversal St Starter Input Assignment Starter Input Assignment</th> <th>ster Pre</th> <th colspan="3">Starter Timer Settings Piestart Vaning Time: 10 20 00 Execution Time: 10 200 2 no</th>		Starter Type Direct On Line Reversal St Starter Input Assignment Starter Input Assignment	ster Pre	Starter Timer Settings Piestart Vaning Time: 10 20 00 Execution Time: 10 200 2 no		
Auto (PLC) = 10. Operator panel = 1 Inference Feedbal Local DigPidroput, 1 Stat >> DigPidroput, 2 Stat << DigPidroput, 2 Stat <<<	t "Local Field Ck Signal from Switchgese Zero (17) ▼ Start > Zero (17) ▼ Start < Dechtforget 3 ≫ 15ton	Stat > Stat > Stat - Reve Stat < Stat - Reve State Or Job / Main State OP_2 - Forward State OP_3 - Reverse State OP_4 -	Unaul	Backupa Time (10 5) orc DC Busing Time (250 5) m * Relati Time (0 5) orc Star Maximum Time (10 5) orc Transition Time (0 5) na estime current Time (2000 5) m * Colls		
Renole Zero (0) Stat >> Zero (0) Stat >> Zero (0) Stat <> Zero (0) Stat <		Activity Flags Provide Stat Varying Active DC Break hipection Active Backspin Active Statter Trip Flags Exaction Each	(0P_6) e (0P_7) (0P_8) (0P_9)	RL3 (StateOup.3 * RL2 (StateOup.3 * RL3 (PasSatWarf * RL4 LogeFunc.1 *		
Auto PLC_Input_1 Start >> PLC_Input_2 Start << PLC_Input_4 Inteduck	Zero (0) Stat > Zero (0) Stat <	Feedback Fault	# Bead settings hom n	New Transmit cettings to relay		



Test Screen

Actual	Settings Control Logic		Control Logic	Starter Configuration		Real Time Clock	Jock Fault History		Comms + Statistics Records
Ser.	1	andy 1	Cactanos	Sir	nulated inj	ection Test	(Control	a notice 1	
■ 0 Lini	- 400 300 200 € 200 V white 0 V white 0	- 400 - 200 - 200 - 100 - 0 - V blar - 0 	The 1000 Final Action of the International Actional Action	1000 1000	1000 1900	■ 100 100 100 100 100 100 100 100	t 100 t 100 100 100 100 100 100 100 100	- 3000 - 2500 - 2000 - 1500 - 500 - 500 Earth Leak (m/s) - 0	Simulated RTD Temperatures RTD 1 0 2 °C RTD 2 0 2 °C RTD 3 0 2 °C RTD 4 0 2 °C Simulated 4 to 20th A Signali Analog Input 2 °C °C Analog Input 2 ?C °C °C Analog Input 2 ?C °C °C
Simulation (antialion	30 20 10 0 Them capac	40 50 60 70 90 70 90 90 51% used Themal Capacity Relay Trip 51w	Sim	Autom Mode Sr Automytic er: Alarm to Trip out 1 1 yr Colls Relay 1 8 Relay 2 8 Relay 3	olector : D Time D 3 sec D 4 sec D 4 sec D 4 sec D 5 Relay 5 Relay 7 Relay 8	Digital Field Si Input 1 1 Input 2 1 Input 3 1 F_Input Mode Real Simulation	nput 4 Input 5 Re nput 5 Re Please to vide a qui of the tela due to pro sonal and	Imput 8 Imput 11 Imput 14 Imput 9 Imput 12 Imput 13 Imput 10 Imput 12 Imput 15 Imput 10 Imput 14 Imput 15 Imput 10 Imput 15 Imput 15 Imput 10 Imput 16 Imput 16 Imput 16 Imput 16 Imput 16 I

Actual Data Recorder



Electrical Connection Diagram for ProBeck-IPS Relay



PB-CT-CAB-1000-100mm (FPR 0465)

Connection Diagram for Expanded I/O Module and Pilot Wire - TLM Controller



