TECHNICAL COMPARISON

Type	**X3M X3M-H**	**X3M-D X3M-DH**	**Flash-N Flash-NH**	**Flash-D Flash-DH**	**Fast**
					
Description	**ENERGY DATA MANAGER**		**ENERGY ANALYSER**		**INTELLIGENT TRANSDUCER**

Readings

Voltage *(V)*		U_{1-N}, U_{2-N}, U_{3-N}, U_{1-2}, U_{2-3}, U_{3-1}, $U_{LL\ \Sigma}$, $U_{LN\ \Sigma}$			
Current *(A)*		I_1, I_2, I_3, I , $I_{neutral}$			
Power factor		PF1, PF2, PF3, PF			
Frequency *(Hz)*		f			
Life time *(h)*		Hours, hours/100			
Voltage THD *(%)*		THD-U_1, THD-U_2, THD-U_3, THD-U_Σ			
Current THD *(%)*		THD-I_1, THD-I_2, THD-I_3, THD-I_Σ			
Powers	*Instantaneous*	P_1, P_2, P_3, P - Q_1, Q_2, Q_3, Q - S_1, S_2, S_3, S			
Powers	*Rolling average*	PmΣ, QmΣ(ind), QmΣ(cap), SmΣ *(import)*, PmΣ, QmΣ(ind), QmΣ(cap), SmΣ *(export)*			
Powers	*Max. demand*	PmdΣ, QmdΣ(ind), QmdΣ(cap) SmdΣ *(import)*, PmdΣ, QmdΣ(ind), QmdΣ(cap), SmdΣ *(export)*			
Energies	*Active (Wh)*	Ea *(import)*, Ea *(export)*			
Energies	*Reactive (varh)*	Er (ind), Er (cap) *(import)*, Er (ind), Er (cap) *(export)*			
Energies	*Apparent (VAh)*	Es *(import)*, Es *(export)*			
Energies	*TOU tariff energy tariff MD*	Ea, Er, Es PmdΣ, QmdΣ(ind), QmdΣ(cap) SmdΣ *(up to 8 tariffs x 8 counters each)* *(TOU calendar upload required)*	*not available*	*not available*	*not available*
Events *(only data logging to built-in memory)*		*Short duration events (min. 1 cycle resolution)* Swells, sags/dips *Long duration events (min.1 sec resolution)* Vinterruption, over-U, under-U, over-I *Absolute Min-Max instantaneous values* Vmax, Vmin, Imax, Pmax	*not available*	*not available*	*not available*
Harmonics (FFT *(only for "H" types)*		H_{U1}, H_{U2}, H_{U3} (1 - 31st order) H_{I1}, H_{I2}, H_{I3} (1 - 31st order) Harmonics power (direction)			*not available*

Electrical characteristics

Connection	Thee-phase (3-wire and 4-wire), bi-phase, single phase, LT and HT	
Voltage inputs	Direct 20-500V ph-ph (max 1,7 crest factor) Via external PT (max 400 KV primary) Overload max. 900 Vrms (peak 1 sec)	
Current inputs	Via external CT (max. 10 kA primary; ../5 A secondary) Overload max 100 Arms (peak 1 sec.) Burden < 0,5 Ohm	
Mains frequency	45 ÷ 65 Hz	
Power supply	85÷265 Vac,/100÷374 Vdc *(optional 24 Vac /18-60Vdc)*	85÷265 Vac,/100÷374 Vdc
Self consumption	5 VA	

Front panel

Display *type*	LCD(STN) 256 segm.	LCD(STN), dot-matrix	LCD(STN) 256 segm.	LCD(STN), dot-matrix	*No display*
size	63 x 65 mm.	16 x 65 mm.	63 x 65 mm.	16 x 65 mm.	
backlighting	white Led	white Led	electro luminescent	white Led	
Calibration Led	on front panel	on front panel	on front panel	on front panel	on front panel
Keyboard	9 keys with explicit function recall				*(Dip-switches)*

Functional characteristics

Measurement	True-RMS up to the 31st harmonic			
Quadrants	2 (import) or 4 (import/export) user programmable)			
Accuracy	Class 1 on energy complying with IEC EN 61036 standards			
Sampling	Continuous sampling of the current and voltage waveforms			
Compensation	Automatic compensation of the amplifiers offsets			
Scale change	Automatic scale change on current inputs (2 scales)			
Isolation	Galvanic isolation on all inputs and outputs			
Ref. standards	Safety: IEC EN 61010 cl.2 EMC: IEC EN 61326-1A Accuracy IEC EN 61036			
Data memory	2 Mbyte flash disk	*not available*	*not available*	*not available*
Storage capacity	60-days' load profiles - over 50000 events			
Calendar/clock	RTC + automatic time zone & DST			
Battery support	20 years			

Outputs

Outputs	2 contacts (programmable for pulse, alarm, remote output)	
Output contact rating	27Vdc – 27mA (DIN43864)	
Hardware expansion	2 ports for connection of optional external modules	
Optional modules	RS232, RS-485, 2x4-20 mA, digital I/O (see options)	
Optional functions	FFT harmonics analyses (see add-on functions)	*not available*

Mechanical and environmental

Working temper.	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C	-20/+60 °C
Humidity	90% R.H. non cond.	90% R.H. non cond.	90% R.H. non cond.	90% R.H. non cond.	90% R.H. non cond.
Enclosure	Self-extinguishing plastic material class V0				
Protection degree	IP51 (front panel)	IP20	IP51 (front panel)	IP20	IP20
Size (mm)	96 x 96	6 DIN (105 mm.)	96 x 96	6 DIN (105 mm.)	6 DIN (105 mm.)
Mount	Flush mount	DIN rail	Flush mount	DIN rail	DIN rail
Terminals *type*	Plug-in	Screw connector	Plug-in	Screw connector	Screw connector
max cable size	4 mm^2	4 mm^2	4 mm^2	4 mm^2	4 mm^2
Weight	410 g.	260 g.	380 g.	250 g.	240 g.
Ordering code(s)	PFE 411-00 *(1)* PFE 411-04 *(2)*	PFE 840-00 *(1)* PFE 840-04 *(2)*	PFE 405-50 *(1)* -	PFE 430-00 *(1)* -	PFE 820-00 *(1)* -
(*)	PFE 418-00 *(1)* PFE 418-04 *(2)*	PFE 842-00 *(1)* PFE 842-04 *(2)*	PFE 408-00 *(1)* -	PFE 432-00 *(1)* -	- -

(*) "H" type with on-board FFT harmonic readings ***(1)*** *power supply 85÷265Vac,/100÷374Vdc* ***(2)*** *power supply 24Vac /18-60Vdc)*

Transmission modules

(add on modules complete with plug-in connection cable - Self supplied by the instrument).

Figure / Type					
RS485 interface *Baud rate* *Output* *Install.- Weight* *Ordering code*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 3-pole plug-in connect. rear fitting - 40 g. *PFE 420-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 3-pole screw connector 2 DIN - 75 g. *PFE 830-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 3-pole plug-in connect. rear fitting - 40 g. *PFE 420-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 3-pole screw connector 2 DIN - 75 g. *PFE 830-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 3-pole screw connector 2 DIN - 75 g. *PFE 830-00*
RS232 interface *Baud rate* *Output* *Install.- Weight* *Ordering code*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 9-pole (D-sub9) conn. rear fitting - 45 g. *PFE 421-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 6 pole screw connector 2 DIN - 80 g. *PFE 825-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 9-pole (D-sub9) conn. rear fitting - 45 g. *PFE 421-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 6 pole screw connector 2 DIN - 80 g. *PFE 825-00*	MODBUS (RTU, ASCII) 2.400 - 38.400 bps 6 pole screw connector 2 DIN - 80 g. *PFE 825-00*
Analogue output *Output* *Install.- Weight* *Ordering code*	2 outputs (4-20mA) 3-pole plug-in connect. rear fitting - 45 g. *PFE 422-00*	2 outputs (4-20mA) 3 pole screw connector 2 DIN - 75 g. *PFE 835-00*	2 outputs (4-20mA) 3-pole plug-in connect. rear fitting - 45 g. *PFE 422-00*	2 outputs (4-20mA) 3 pole screw connector 2 DIN - 75 g. *PFE 835-00*	2 outputs (4-20mA) 3 pole screw connector 2 DIN - 75 g. *PFE 835-00*
Digital I/O output *Output* *Install.- Weight* *Ordering code*	2 inputs - 2 outputs 3x3 pole plug-in conn. rear fitting - 45 g. *(pending)*	*not available*	2 inputs - 2 outputs 3x3 pole plug-in conn. rear fitting - 45 g. *(pending)*	*not available*	*not available*

Add-on functions

FFT harmonics	Instrument upgrade to include FFT harmonics analyses.		*not available*
Upgrade method	Performed by simple PUK code entry operated via instrument keyboard.		
Effect	Converts X3M, X3M-D into ".....H" model.	Converts Flash-N, Flash-D into ".....H" model.	
Ordering code	*PFSW 399-00*		