

THE DEGREE OF PROFESSIONALISM: EXTREMELY HIGH.

Suitable for a wide range of applications including electrical, food preparation, automotive, maintenance, construction, health and safety – the environmental measurement devices from geo-FENNEL are reliable partners wherever physical values such as temperature and humidity must be precisely determined. They are characterized by their ease of use and intuitive operation – taking precise measurement to achieve visible and tangible results.



FVE 100 Video Borescope

- Video borescope for inspection and survey of inaccessible areas.
- **Trades and tasks:** Sanitary, heating and ventilation, car industry, workshops, renovation.

>> OPTIONAL FOR FVE 100 AND FVE 150

Optional accessories: Gooseneck probes of 1 m and 2 m length with standard camera head of 17 mm and with 9 mm only.

Reference	Gooseneck length	Camera head diameter	ArtNo.
P 1-17	1 m	17 mm	800750
P 2-17	2 m	17 mm	800751
P 4-17	4 m	17 mm	800754
P 1-9	1 m	9 mm	800752
P 2-9	2 m	9 mm	800753
P 4-9	4 m	9 mm	800755





TECHNICAL DATA	FVE 100	FEATURES	SUPPLIED WITH FVE 100
			ARTNO. 800700
Camera head Viewable angle Focal length Viewable distance Diameter of camera head Light source Display Display size Resolution Image transmission to LCD	0° and 180° 6–7 cm 5–15 cm 17 mm LED 3″ 960 x 240 pixel Flexible gooseneck	 Water proof camera head and probe 1 m long flexible gooseneck probe with camera head for the optical inspection of inaccessible areas Camera head with LED lighting Immediate transfer of the colour image to the large LCD display 180° image rotation at the press of a button Direct transfer of image to television or notebook Accessories: Hook and magnet attachments for object retrieval 	ART-NO. 800700 Video borescope 1 m flexible gooseneck probe TV cable USB cable Charger Magnet Hook Mirror Container
CMOS Image sensor Video output (to TV)	300.000 pixel PAL / NTSC	· Accessories:	
Various Probe length Bend radius of probe Dust / water protection probe and camera Power supply Operating time Temperature range Humidity range Dimensions Weight with probe	100 cm 6 cm IP 67 3.7 V / 2000 mAH Li-Ion 4 h -10 °C - + 50 °C 15 % - 85 % RH 240 x 160 x 100 mm 0.584 kg		



FVE 150 Video Borescope

- Video borescope for inspection and survey of inaccessible areas. Photos and videos can be memorized for documentation purposes.
- **Trades and tasks:** Sanitary, heating and ventilation, car industry, workshops, renovation.



1 With SD-card for fast transmission of the data to PC

TECHNICAL DATA	FVE 150	FEATURES	SUPPLIED WITH FVE 150
			ARTNO. 800710
Camera head		· Water proof camera head and probe	
Viewable angle	0° and 180°	· 1 m long flexible gooseneck probe	· Video borescope
Focal length	6–7 cm	with camera head for the	1 m flexible gooseneck probe
Viewable distance	5–15 cm	optical inspection of inaccessible	· TV cable
Diameter of camera head	17 mm	areas	· USB cable
Light source	LED	· Camera head with LED lighting	· Charger
Display		· Immediate transfer of the colour	· Magnet
Display size	3.2"	image to the large LCD display	· Hook
Resolution	320 x 240 pixel	• 180° image rotation at the press	· Mirror
Image transmission to LCD	Flexible gooseneck	of a button	· 4 GB SD-card
CMOS Image sensor	300.000 pixel	 Internal memory or SD-card to 	· Container
Video output (to TV)	PAL / NTSC	store images and video sequences	
Picture / video formats	JPG / 3 GP	· 4 GB SD-card included (supports	
Resolution picture / video	320 x 240 Pixel	up to 8 GB)	
Various		· Date and time indication on the	
Internal memory	70 MB	display	
Additional memory	4 GB SD-card	· Transmission of video clips /	
	supports up to 8 GB (optional)	images onto television or PC for	
Operation languages	EN, FR, DE, ES, IT, FI	editing or documentation	
Probe length	100 cm	· Multi-language menu (DE, EN, FR,	
Bend radius of probe	6 cm	ES, IT, FI)	
Dust/water protection probe/camera	IP 67	· Accessories: see FVE 100	
Power supply	3.7 V / 2000 mAH Li-lon		
Operating time	4 h		
Temperature range	-10 °C – + 50 °C		
Humidity range	15 % – 85 % RH		
Dimensions	240 x 160 x 100 mm		
Weight with probe	0.584 kg		



FIRT 550-Pocket and FIRT 800-Pocket Infrared Thermometer

- Small and handy infrared thermometer, easy to operate, for versatile applications. Particular feature: Measurement with dual laser to focus the target.
- Trades and tasks: Heating, ventilation and refrigeration systems, food industry, car industry, construction, building construction, fire inspection, injection molding industry, ship maintenance, isolation (heat loss), drying facility.

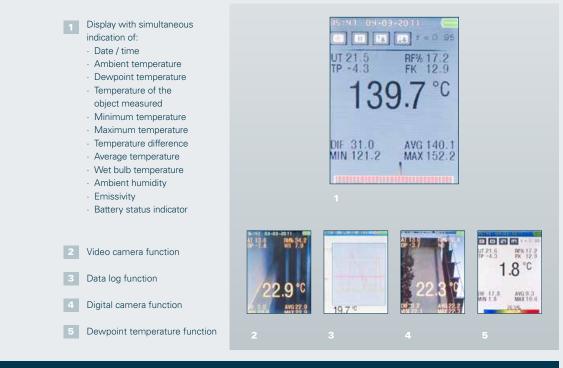
1 The dual laser dot to focus the target

TECHNICAL DATA	FIRT 550-POCKET	FIRT 800-POCKET	FEATURES
D(istance):S(pot)	12:1	10:1	For non-contact measurement with
Temperature range	-50 °C – +550 °C	-35 °C – +800 °C	laser dot. Quick measurements for:
Ø measuring spot at 100 cm	80 mm	100 mm	· Surfaces which are difficult to reach
Emissivity	adjustable 0.1 – 1.0	adjustable 0.1 – 1.0	 Moving or rotating objects
Laser pointer	yes, dual	yes, dual	 Electrified parts
Auto data HOLD	yes	yes	· Chemicals
Illuminated display	yes	yes	· Hot objects
Max, Min	Max only	yes	
High and low alarm	yes	yes	
Power supply	9 V battery	9 V battery	SUPPLIED WITH
Response time	< 1 sec	< 1 sec	FIRT 550-POCKET
Resolution display	0.1 °C	0.1 °C	FIRT 550-POCKET
Accuracy	± 1 %	± 1 %	ARTNO. 800001
Laser class	2	2	
Weight	0.178 kg	0.178 kg	· Case and battery
Dimensions	146 x 104 x 43 mm	160 x 82 x 42 mm	
			SUPPLIED WITH
			FIRT 800-POCKET
			ARTNO. 800002
			· Case and battery

FIRT 1000 DataVision Infrared Thermometer

Infrared thermometer with a large temperature range and integrated 2.2" TFT colour LC display for monitoring and evaluation of monitored data.

Trades and tasks: Old-building renovation, heating, ventilation construction, building construction, food control, drying facility, isolation (heat loss).



	FEATURES	SUPPLIED WITH
0:1 50 °C - +1000 °C 0 mm djustable 0.10 - 1.0 es, dual es es es 50 ms 1 °C - 1000 °C °C over 1000 °C 50 °C - +1370 °C 1.0 % ± 1 °C 0.5 % ± 1.5 °C 45 kg 05 x 62 x 155 mm	 For non-contact temperature measurement with laser dot Short response time of 150 ms and an accuracy of ± 1,0 % 2.2" TFT colour LC display Dual laser pointer for better targeting Permanent measuring Compatible with all standard connector Type-K thermocouples Easy transmission of measurements to PC via USB Memory socket for Micro-SD Cards Integrated camera for images (JEPG) and video (AVI) Date / Time function Measurement of air humidity and ambient temperature Determination of dewpoint 	ARTNO. 800030 • Battery • USB cable • Mini tripod • Type-K temperature probe • Case
	0 °C - +1000 °C 0 mm ljustable 0.10 - 1.0 is, dual is is is is 7 V Li-lon battery 150 ms 1 °C - 1000 °C °C over 1000 °C 0 °C - +1370 °C 1.0 % ±1 °C 0.5 % ± 1.5 °C 45 kg	$0 \circ C - \pm 1000 \circ C$ measurement with laser dot 0 mm Short response time of 150 ms and an accuracy of $\pm 1,0 \%$ $1 \text{justable } 0.10 - 1.0$ $2.2"$ TFT colour LC display 1ss $2.2"$ TFT colour LC display 2ss $2.2"$ Transmission of 2ss $2.2"$ Transmission of 2ss $2.2"$ Term 2ss <t< td=""></t<>





FIRT 1600 Data Infrared Thermometer

- >>> For very high temperature measurements.
- With integrated memory for monitoring and analysis.
- Trades and tasks: Foundry, monitoring of: brake drums, discs, electric motors, exhaust systems.



FHT 70 DataLog Temperature and Humidity Data Logger

- Data logger for recording temperatures and air humidity over a longer period for check-up and analysis.
- **Trades and tasks:** Cold storage house, drying, gallery, food industry.

TECHNICAL DATA	FHT 70 DATALOG			FEATURES	
Function	Range	Basic accuracy	Resolution	• Measures temperature and	
Relative humidity	0 % – 100 % RH	± 3.0 %	0.1 % RH	air humidity	
Temperature	-40 °C – 70 °C	±1°C	± 0.1 °C	 Internal memory for 32.700 	
				readings (3 x 10.900)	
Logging rate	Select sampling interval	from 1 sec to 24 h	SUPPLIED WITH	· Selectable measurement	
Operating temperature	-35 °C – +80 °C		SOPPLIED WITH	cycle from 1 sec to 24 h	
Power supply	3.6 V Lithium			· LCD with date, time,	
Size	132 x 66 x 37		ARTNO. 800120	temperature, humidity,	
Weight	180 g			limit value	
·	-		· 3.6 V lithium battery	· Software for analysis	
			Software		
			Clamshell		
			Clarifonoli		

FT 1300-1 / FT 1300-2 Professional K-Type Thermometers with single and dual input



Trades and tasks: Temperature measurements of liquid construction materials like asphalt, isolation checks, measurements in the HVAC branch, energy supply, industrial and laboratory application. 6

TECHNICAL DATA	FT 1300-1	FT 1300-2	FEATURES
ARTNO.	800400	800410	_
			· Indication of maximum value
Scanfunction	1 measurement	2 measurements simultaneously	(MAX)
		or temperature difference	Data HOLD function
Sampling rate	2.5 x per second	2.5 x per second	· Large display (45 mm) with
Accuracy	± 0,5 % / ± 1 °C	± 0,5 % / ± 1 °C	illumination
Display resolution	0.1 °C / 1 °C	0.1 °C / 1 °C	
Temperature range	-50 °C – +1300 °C	-50 °C – +1300 °C	SUPPLIED WITH
Measuring units	°C / °F / K	°C / °F / K	SOPPLIED WITH
Dimensions	162 x 76 x 39 mm	162 x 76 x 39 mm	
Weight	0.21 kg	0.21 kg	
Power supply	Alkaline batteries	Alkaline batteries	· Flexible wire probe TP-300
			Set of batteries
			· Case

FT 1000-Pocket Digital Thermometer



Trades and tasks: Temperature measurement of liquids and soft materials.

TECHNICAL DATA	FT 1000-POCKET	FEATURES	SUPPLIED WITH
			ARTNO. 800420
Temperature range	-20 °C - +1000 °C	 Handy thermometer with 	
Accuracy	± 3 %	immersion probe	 Set of batteries
HOLD function	yes	· Pocket-size, light weight, easy to	Incorporated all-purpose probe
Automatic shut-off	yes	operate	
Battery status indicator	yes		
Dimensions	117 x 65 x 24 mm		
Weight	0.16 kg		
Power supply	Alkaline batteries		
0	U		

FHT 60 and FHT 100 Humidity and Temperature Meter

Trades and tasks: Environmental monitoring, warehouses, production facilities, greenhouses (floristics), ventilating and air-conditioning, civil engineering, construction physics, expert report.



>> FHT 60

>>> FHT 100

TECHNICAL DATA	FHT 60	FHT 100	FEATURES
ARTNO.	800100	800110	
			· Fast measurement of relative
Temperature range	-20 °C – +60 °C	-30 °C – +100 °C	humidity and temperature
Humidity range	0 % – 100 % RH	0 % – 100 % RH	
Fast response time	yes	yes	FHT 100
Illuminated display	yes	yes	Dewpoint temperature
Max HOLD	yes	yes	measurement for recognition of
Data HOLD	yes	yes	mold building up and wet bulb
Dewpoint temperature	no	-30 °C – +100 °C	temperature measurement
Wet bulb temperature	no	0 °C – +80 °C	(evaporation temperature)
Accuracies:			
Humidity	± 3.5 % RH	± 2 % RH	SUPPLIED WITH
Temperature	±2°C	± 0.5 °C	
Dewpoint	-	± 0.5 °C	
Wet bulb	-	± 0.5 °C	· Case
			· Battery
			,



FHM 10 Moisture Meter

Pocket-size moisture meter for fast and convenient measurement of moisture content.

Trades and tasks: Building and construction: plaster, gypsum, concrete and mortar; wood construction: sawn timber; general: firewood, wood, cardboard, paper.

TECHNICAL DATA	FHM 10	FEATURES	SUPPLIED WITH
			ARTNO. 800310
Measuring range wood	6 % - 44 %	· Measurement principle: electrical	
Accuracy wood	±1%*	resistance	· CR2032 batteries
Measuring range other materials	0.2 % - 2 %	· Dual display for wood and	
Accuracy other materials	± 0,05 %	construction materials	
Power supply	3 x CR2032 batteries	· Replaceable 8 mm measuring pins	
Dimensions	130 x 40 x 25 mm	 Protective cap with integrated 	
Weight	102 g	function and battery check	
		Automatic power-off	
		· Impact resistant housing	

*Average adjustment for European wood based on wood temperature of 20 °C



FHM 20 Moisture Meter

Moisture meter for wood and building materials.

Wood: Calibrated to 170 wood types in 8 groups.

Building materials: Gypsum, plaster, concrete, concrete screeds, mortar, cardboard, paper.

Measurement of humidity permeation, surface humidity, determination of dry and humid areas.

TECHNICAL DATA	FHM 20	FEATURES	SUPPLIED WITH
			ARTNO. 800320
Measuring principle	Electrical resistance	 External moisture measurement 	
Measuring range wood	6 – 99,9 %	probe	 Moisture and temperature probe
Accuracy wood	±1%*	· External temperature probe: at	 Padded bag
Measuring range building materials	3-33 %	measurement with moisture and	 2 x spare measuring pins
Accuracy building materials	±1%	temperature probe the moisture	· 2 x AAA Batteries
Range temperature measurement	0 °C – +60 °C	measurement is carried out with	
Dimensions	180 mm x 50 mm x 31 mm	automatic temperature	
Weight	175 g	compensation. This leads to a	
		higher accuracy	
		8 mm measuring pins	
		(replaceable)	
		Protective cap with integrated	
		calibration check	
		Battery indicator	<u> </u>
		Automatic power-off (adjustable	
		time)	
		time,	V I





FFM 100 Moisture Detector

Quick non-destructive measurement of surface humidity up to 40 mm measuring depth.

Trades and tasks: Building materials, concrete floors, walls, ceilings.

TECHNICAL DATA	FFM 100	FEATURES	SUPPLIED WITH
			ARTNO. 800650
Measuring depth	20 – 40 mm	Quick measurement of humidity	
Measuring range	0 – 100 digits	in building materials without	 Set of batteries
Resolution	1 digit	destruction of the surface	
HOLD function	yes	 Indication of minimum / 	
Display illumination	yes	maximum values	
Automatic shut-off	yes	· Sensor type: metal spheroid	
Battery status indication	yes		
Dimensions	80 x 45 x 45 mm		
Weight	0.18 kg		
Power supply	Alkaline batteries		



FTA 1 Thermometer-Anemometer

- A professional remote vane thermo-anemometer for measuring air velocity, air flow and temperature.
- Trades and tasks: Ventilation and air-conditioning: installation of ventilation systems, measurements of air flow and temperature; agriculture: crop spraying, ventilation surveys and crop storage; environmental monitoring.

TECHNICAL DATA	FTA 1			FEATURES
Air velocity	Measuring range	Resolution	Accuracy	· Simultaneous display of
m/s	0.40 - 30.00	0.01	± 3 % ± 0.20 m/s	air flow or air velocity and
ft/min	80 - 5900	1	± 3 % ± 40 ft/min	ambient temperature
km/h	1.4 - 108.0	0.1	± 3 % ± 0.8 km/h	· Large easy-to-read LCD
mph	0.9 - 67.0	0.1	± 3 % ± 0.4 mph	with switchable backlight
knots	0.8 - 58.0	0.1	± 3 % ± 0.4 knots	· Maximum / minimum
				function
Air flow	Measuring range	Resolution	Accuracy	· 20 average readings for air
CMM (m³/min)	0 - 999,900	0.001	0 – 999.9 m²	flow and air velocity
CFM (ft ³ /min)	0 – 999,900	0.001	0 – 999.9 ft²	· Data HOLD function
				· 16 memory locations for
Air temperature	Measuring range	Resolution	Accuracy	area (8 CMM, 8 CFM)
°C	-10 °C – +60 °C	0.1 °C	± 2 °C	· Remote vane with low-
°F	14 °F – 140 °F	0.1 °F	± 4 °F	friction bearing (65 mm
				diameter) for accurate
Various			SUPPLIED WITH	results
Power supply	1 x 9 V		SOPPLIED WITH	
Operating time	80 h			
Dimensions	75 x 203 x 50 mm		ARTNO. 800450	
Weight	280 g			
			· Sensor with 120 cm cable	
			· 9 V alkaline battery	
			· Container	



FSM 130+ Sound Level Meter

Trades and tasks: Industry, health and safety, school, public works, environmental measurements.

TECHNICAL DATA	FSM 130+	FEATURES	SUPPLIED WITH
			ARTNO. 800210
Low range (Lo)	35–100 dB	 For quick check of sound level 	
High range (Hi)	65–130 dB	 Standard IEC 651 type 2 	· Case
Frequency weighting A, C	Lo 35–100 dB		· Battery
	Hi 65–130 dB		
Max HOLD	yes		
Data HOLD	yes		
Analogue AC/DC output	yes		
to analyzer or recorder			
IEC 651 Type 2 standard	yes		
Built-in calibration check	yes		
Accuracy at 94 dB	1.5 dB		
Operation temperature	0 °C – +40 °C		
Operation humidity	< 80 % RH		



FMM 5 5-in-1 Digital Multimeter



Trades and tasks: Universal measuring device for DC and AC voltage, DC current resistance, transistor hFE diode and continuity test, light (luminosity), sound, humidity, temperature overload protection.

TECHNICAL DATA	FMM 5			SUPPLIED WITH
				ARTNO. 800600
Multimeter	Max. Range	Resolution	Accuracy	
Voltage DC	600 V	0.1 mV	$\pm 0.5 \% \pm 2^*$	· All-purpose probe TP-500
Voltage AC	600 V	100 mV	± 1.2 % ± 10*	 Set of batteries
Current DC	10 A	0.1 µA	± 1.0 % ± 2*	· Case
Resistance	20 ΜΩ	0.1 Ω	$\pm 0.8 \% \pm 2^*$	· Testing cable
Environment	Max. Range	Resolution	Accuracy	
Light (luminosity)	20,000 Lux	0.1 Lux	$\pm 0.5 \% \pm 10^*$	
Sound	100 dB	0.1 dB	± 3.5 dB	
Humidity	95 % RH	0.1 % RH	± 5.0 % RH	
Temperature	-20 °C – +200 °C	0.1 °C	$\pm 3.0 \% \pm 1*$	
	-20 °C - +1300 °C	0.1 °C	$\pm 3.0 \% \pm 5^*$	



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FGD 1 Gas Leak Detector

Easy-to-use gas leak detector for locating gas leaks from a safe position.

Detects following gas types: Natural gas, propane, butane, methane, acetone, alcohol, gasoline, jet fuel, carbon monoxide, ammonia, steam, hydrogen sulfide, smoke, industrial solvents, lacquer thinner, naphta.

Trades and tasks: Gas industry, chemical industry, laboratory, car repair shops.

TECHNICAL DATA	FGD 1	FEATURES	SUPPLIED WITH
			ARTNO. 800470
Sensitivity	50 ppm	· 40 cm gooseneck detector	
Sensor type	Low power semi-conductor	 Visual leak detection by LED 	· Batteries
Warm-up time	approx. 60 sec	indicators	
Response time	< 2 sec	· Precision sensor detects even the	
Duty cycle	continuous	smallest leaks	
Probe length	40 cm	· Fast response of less than two	
Power supply	3 x C Alkaline	seconds	
Operating time	8 h	 Includes earphone jack 	
Alarm	visible and audible		
Size	221 x 72 x 46 mm		
Weight	498 g		



FLM 400 Data Luxmeter

Luxmeter for professional indoor measuring and monitoring of light insolation.

Trades and tasks: Building construction, indoor construction, censor.

TECHNICAL DATA	FLM 400 DATA	FEATURES	SUPPLIED WITH
Maximum measuring range Accuracy Resolution Sampling rate Data HOLD function Automatic power-off Output Power supply Size photo detector Size instrument	400,000 Lux ± 5 % ± 10 d (< 10,000 Lux) ± 10 % ± 10 d (> 10,000 Lux) 0.1 Lux 1.5 times / sec yes USB 9 V NiMh 115 x 60 x 27 mm 203 x 75 x 50 mm	 Measuring range 0 to 400,000 Lux Sampling rage 1.5 times / sec Large LC display Measuring range 4,000 digits 41 analogue bargraph indication 99 values in memory for direct reading on the meter 16,000 values can be stored in data logger Max / Min function High accuracy and short response 	ART-NO. 800510 • 9 V battery • Photo detector • USB cable • Software • Carrying case
Weight	390 g	High accuracy and short response time USB-interface	



FCT 1 Data Coating Thickness Tester

>>> Coating Thickness Tester for fast testing and measuring of non-magnetic coatings on steel or non-ferrous metals.

>> Trades and tasks: Paint shops, car industry, construction.

>>> Accessories for calibration

TECHNICAL DATA	FCT 1 DATA		FEATURES	SUPPLIED WITH	
				ARTNO. 800460	
	Probe F	Probe N	 Internal memory for 80 		
Working principle	Magnetic induction	Eddy current principle	readings per group	 2 x AAA batteries 	
Measuring range	0–1250 µm	0–1250 µm	· Easy data transfer to	 USB cable 	
	0-49.21 mils	0–49.21 mils	PC by USB	· Software	
Guaranteed tolerance	0–850 μm (± 3 % +1 μm)	0–850 μm (± 3 % +1.5 μm)	· PC software	· Calibration accessories	
(of reading)	0–33.46 mils	0–33.46 mils	· Measures insulating coat-	· Case	
	(± 3 % +0.039 mils)	(± 3 % +0.059 mils)	ings on non-ferrous metals		
	850–1250 μm (± 5 %)	850–1250 μm (± 5 %)	· Automatic recognition of		
	33.46-49.21 mils (± 5 %)	33.46-49.21 mils (± 5 %)	the material (Fe / NFe)		
Resolution 0 – 50 µm	0.1 µm	0.1 µm	· Sensor with V-groove for		
Resolution 0 – 1.968 mils	0.001 mils	0.001 mils	measurements of round		
Diameter of minimum area	7 mm	5 mm	objects		
Basic thickness of material	0.5 mm	0.3 mm	· Magnetic induction and		
Working temperature	0 °C - +40 °C	0 °C - +40 °C	eddy current measuring		
Working relative humidity	20 % ~ 90 %	20 % ~ 90 %	principle		
Power supply	2 x AAA Alkaline	2 x AAA Alkaline	· Single and permanent		
Size	113.5 x 54 x 27 mm	113.5 x 54 x 27 mm	measurement		
Weight	110 g	110 g	· AVG / Max / Min function		
-		-	· Alarm function		

Accessories for Environmental Measuring Equipment



OUTLINE					
Accessories	Function	Length	Temperature range	suitable for	ARTNO.
TP-300	Flexible wire probe	100 cm	-50 °C – +300 °C	FT1300-1, -2, FMM5	800900
TP-500	All-purpose probe (metal tip length 7 mm)	85 cm	-50 °C – +900 °C	FT1300-1, -2, FMM5	800901
TP-550	All-purpose probe (metal tip length 15.5 cm)	94 cm	-50 °C – +900 °C	FT1300-1, -2, FMM5	800906
NR-88B	Flexible steel probe	100 cm	-50 °C – +450 °C	FT1300-1, -2, FMM5	800902
NR-31B	Surface temperature probe	12 cm	-50 °C – +450 °C	FT1300-1, -2, FMM5	800903
NR-33	Right angle surface temperature probe	34 cm	-50 °C – +450 °C	FT1300-1, -2, FMM5	800904
NR-38	Air temperature probe	21 cm	-50 °C – +800 °C	FT1300-1, -2, FMM5	800905

