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» 3 Preamplifiers

Preamplifiers

Preamplifier type	Main feature	Detector package	Detector type	Detector cooling	Radiator, cooling, TEC controlling	Input noise voltage density	Input noise current density	Low cut-off frequency
						$e_n \left[\frac{nV}{\sqrt{Hz}} \right]$	$i_n \left[\frac{pA}{\sqrt{Hz}} \right]$	$f_{lo} [Hz]$
VIP	standalone	BNC	PV, PVI, PVM, PVMI	uncooled	not needed	0.97 – 8.0 ¹⁾	0.02 – 3.5 ¹⁾	DC, 10, 100, 1k, 10k
μ IP	micro-size	TO39	PC, PCI, PV, PVI, PVM, PVMI	uncooled	not needed	0.97 – 8.0 ¹⁾	0.02 – 3.5 ¹⁾	DC, 10, 100, 1k, 10k
QIP	four-channel	TO8	PCQ, PVQ, PVMQ	uncooled	on board radiator and TEC controller, fan	0.97 – 8.0 ¹⁾	0.02 – 3.5 ¹⁾	DC, 10, 100, 1k, 10k
SIP	ultra-small, OEM	TO39 TO8	PC, PCI, PV, PVI, PVM, PVMI	uncooled 2TE, 3TE, 4TE	external heatsink needed	0.97 – 8.0 ¹⁾	0.02 – 3.5 ¹⁾	DC, 10, 100, 1k, 10k
FIP	very fast	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator, fan	1.1	5.0	1k, 10k
MIP	standard	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator, fan	0.97 – 8.0 ¹⁾	0.02 – 3.5 ¹⁾	DC, 10, 100, 1k, 10k
PIP	programmable	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator, fan	0.95	4.5 7.0	DC/10
AIP	on board TEC controller	TO8	PC, PCI, PV, PVI, PVM, PVMI	2TE, 3TE, 4TE	on board radiator and TEC controller, fan	0.97 – 8.0 ¹⁾	0.02 – 3.5 ¹⁾	DC, 10, 100, 1k, 10k

¹⁾ noise measurement frequency $f_0 = 10kHz$

²⁾ first stage transimpedance = $1k\Omega$

³⁾ first stage transimpedance = $5k\Omega$

⁴⁾ transimpedance range $\frac{K_{imax}}{K_{imin}}$ up to 5 (dependent on f_{hi})

⁵⁾ $f_{hi} \leq 1MHz$, load resistance $R_L = 1M\Omega$

⁶⁾ $f_{hi} > 1MHz$, load resistance $R_L = 50M\Omega$

Preamplifiers

High cut-off frequency	Transimpedance	Output impedance	Output voltage swing	Output voltage offset	Power supply voltage	Power supply current	Supply connector	Signal output
$f_{hi}[\text{Hz}]$	$K_i \left[\frac{V}{A} \right]$	$R_{out}[\Omega]$	$V_{out}[V]$	$V_{off}[mV]$	$V_{sup}[V]$	$I_{sup}[mA]$		
100k, 300k, 1M, 5M, 10M, 20M	fixed up to 1.0×10^5	50	$\pm 10^{5j}$ $\pm 2^{6j}$	max $\pm 20^{9j}$	$\pm 15^{12j}$ $\pm 9^{13j}$	max ± 25	DB9	BNC
100k, 300k, 1M, 5M, 10M, 20M	fixed up to 1.0×10^5	50	$\pm 2^{5j}$ $\pm 1^{6j}$	max $\pm 20^{9j}$	± 9	max ± 50	MOLEX1x3	MMCX
100k, 300k, 1M, 5M, 10M, 100M	fixed up to 2.0×10^5	50	$\pm 2^{5j}$ $\pm 1^{6j}$	max $\pm 20^{9j}$	+5	max ± 50	DC 2.1/5.5	4xMCX
100k, 300k, 1M, 5M, 10M, 100M, 250M	tunable ⁴⁾ up to 1.0×10^5	50	$\pm 10^{5j}$ $\pm 1^{6j}$	max $\pm 20^{9j}$	$\pm 15^{12j}$ $\pm 9^{13j}$	max ± 50	AMP2x4	MMCX
1G	fixed up to 8.5×10^3	50	± 1	-	+12/-5	+100 -50	LEMO	SMA (DC monitor as an option)
100k, 300k, 1M, 5M, 10M, 100M, 250M	fixed up to 2.0×10^5	50	$\pm 10^{5j}$ $\pm 2^{7j}$ $\pm 1^{8j}$	max $\pm 20^{9j}$	$\pm 15^{12j}$ $\pm 9^{13j}$	max ± 50	LEMO	SMA
150k/1.5M/20M 1.5M/15M/200M	digitally adjustable 2.5k – 150k ³⁾ 500 – 30k ²⁾	50	± 1	max $\pm 20^9$ (DC) max ± 10 (AC)	± 9	typ ± 80 max ± 100	LEMO	SMA
100k, 300k, 1M, 5M, 10M, 100M, 250M	fixed up to 2.0×10^5	50	$\pm 2^{5j}$ $\pm 1^{6j}$	max $\pm 20^{9j}$	+5 ¹⁰⁾ +12 ¹¹⁾	max ± 50	DC 2.1/5.5	2xSMA (DC monitor as an option)

⁷⁾ $1\text{MHz} < f_{hi} \leq 20\text{MHz}$, load resistance $R_L = 1\text{M}\Omega$

⁸⁾ $20\text{MHz} < f_{hi} \leq 250\text{MHz}$, load resistance $R_L = 50\text{M}\Omega$

⁹⁾ Measured with equivalent resistor at the input instead of the detector. It is to avoid the environmental thermal radiation's impact

¹⁰⁾ with uncooled, 2TE and 3TE detectors

¹¹⁾ with 4TE detectors

¹²⁾ $f_{hi} \leq 1\text{MHz}$

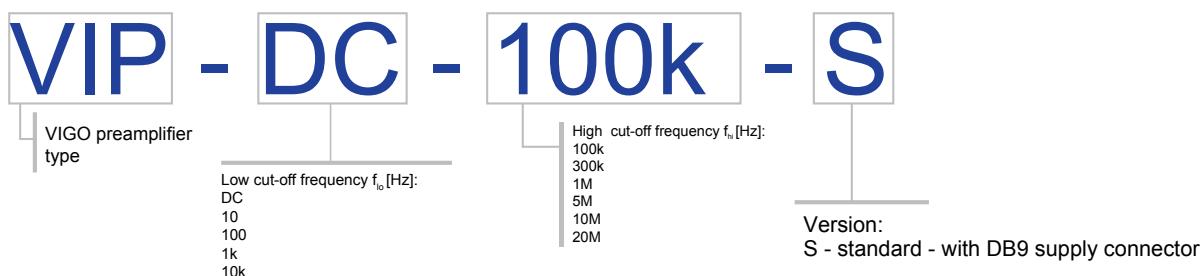
¹³⁾ $f_{hi} > 1\text{MHz}$

VIP preamplifier

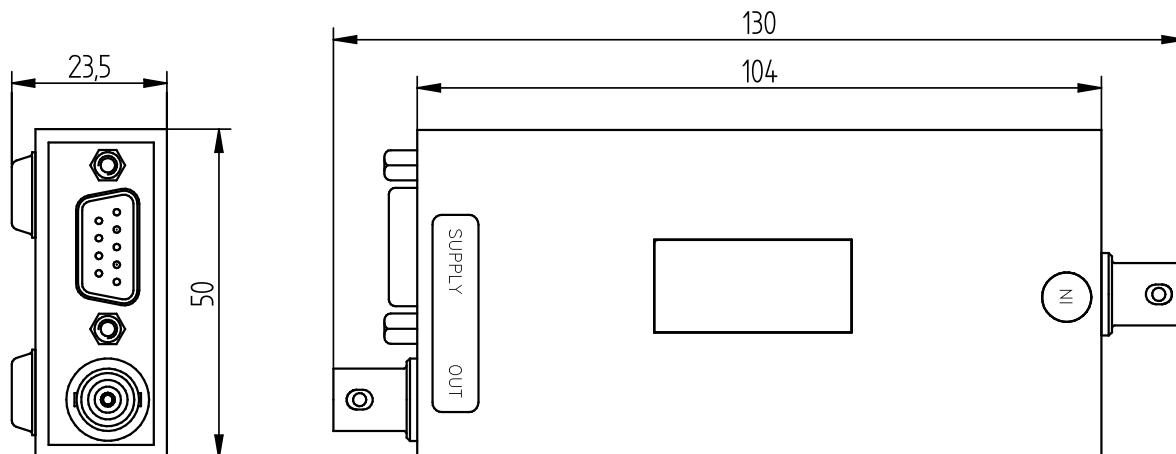


VIP is a transimpedance, AC or DC coupled, standalone preamplifier. It is intended for operating with uncooled, non-biased IR detectors in BNC packages.

Code description

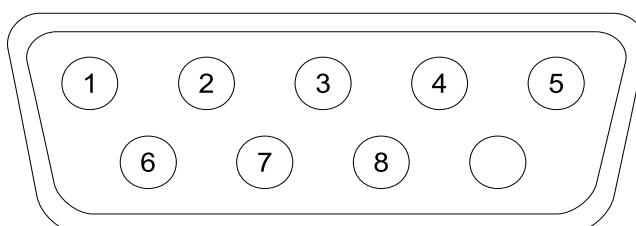


Dimensions [mm]



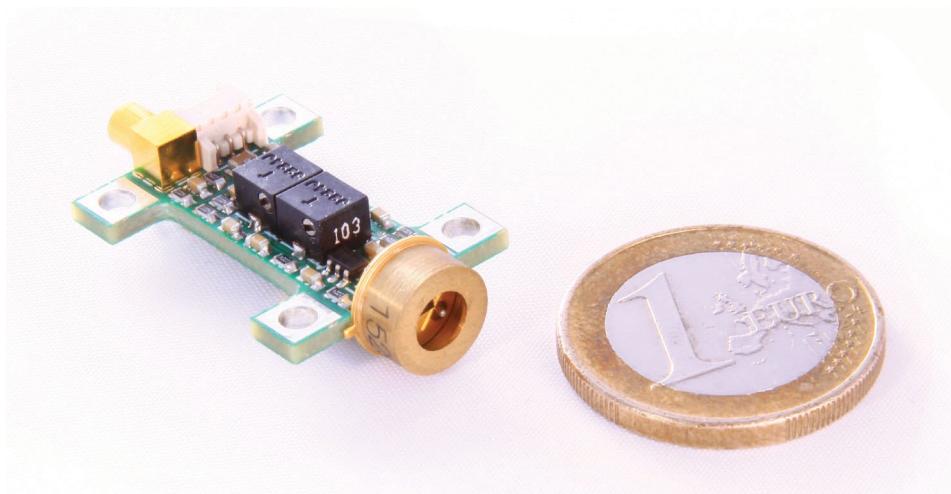
Power supply connector - DB9 connector male

Pin number	Symbol	Function
1	N.C.	not connected
2	N.C.	not connected
3	GND	power ground
4	N.C.	not connected
5	N.C.	not connected
6	$-V_{sup}$	power supply input (-)
7	N.C.	not connected
8	N.C.	not connected
9	$+V_{sup}$	power supply input (+)



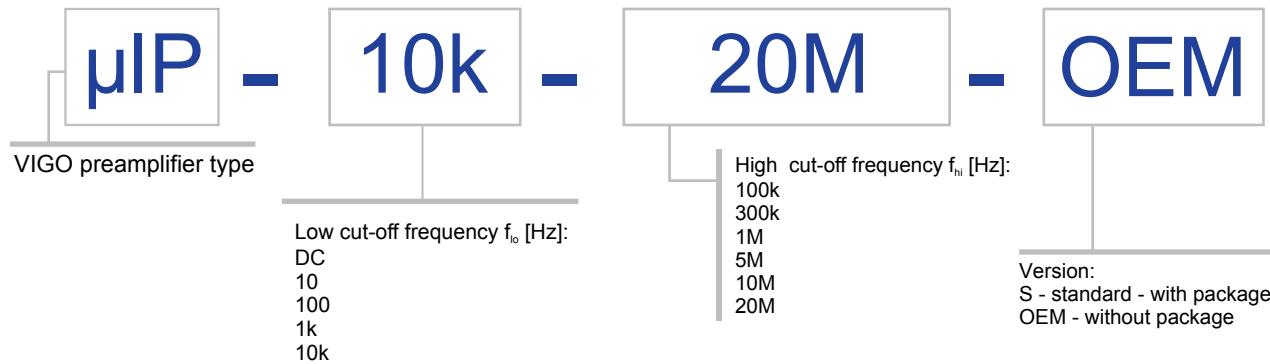
DB9 connector male

μ IP preamplifier

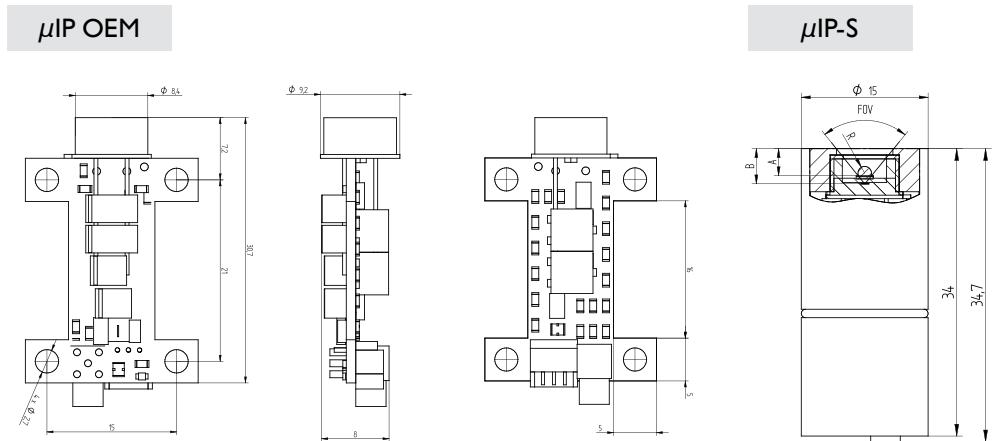


μ IP is a transimpedance, AC or DC coupled, micro-size preamplifier. It is available in two versions: S – standard with package and O – OEM without package. μ IP it is intended to operate with either biased or non-biased uncooled detectors in TO39 package.

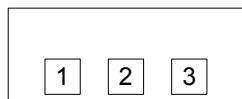
Code description



Dimensions [mm]



Power supply connector - MOLEX1x3 conector female



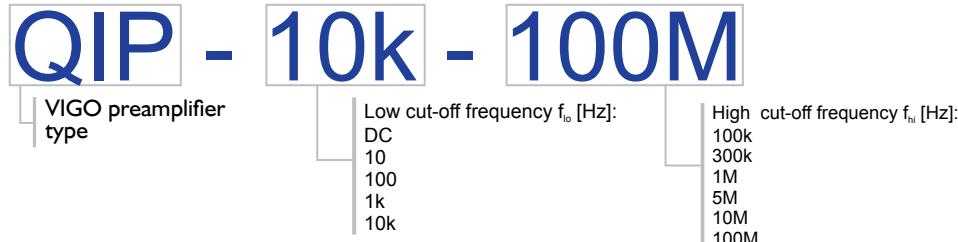
Pin number	Symbol	Function
1	$-V_{sup}$	power supply input (-)
2	GND	power ground
3	$+V_{sup}$	power supply input (+)



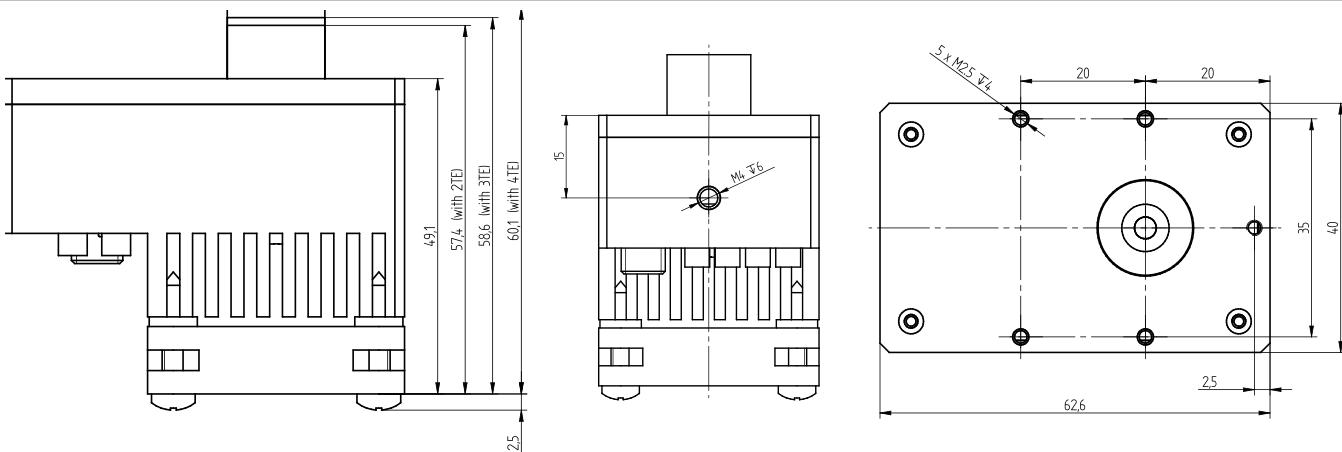
QIP preamplifier

QIP is a four channel, transimpedance, AC or DC coupled preamplifier. It is designed to work with either biased or non-biased, uncooled, quadrant geometry detectors in TO8 package. QIP provides a broad bandwidth up to 100MHz.

Code description

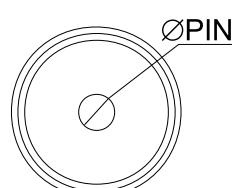


Dimensions [mm]



Power supply connector - DC Jack connector

Type	Voltage [V]	Pin diameter
DC Jack - 2.5	9 -12	Ø 2.5
DC Jack - 2.1	5	Ø 2.1

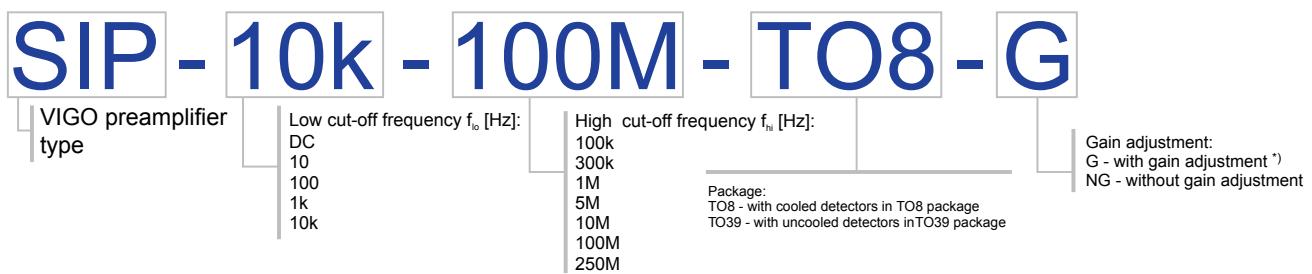


SIP preamplifier



SIP is an ultra small transimpedance, AC or DC coupled preamplifier. It is designed to operate with either biased and non-biased detectors. It is compatible with uncooled detectors in TO39 package or thermoelectrically cooled detectors in TO8 package. SIP is dedicated for OEM applications and requires external heat sink (MHS-2). There is possibility to adjust gain (devices with a bandwidth up to 100MHz).

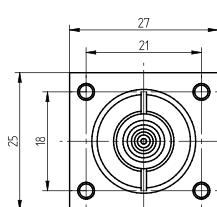
Code description



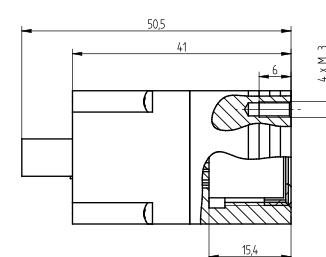
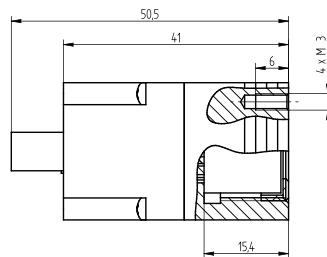
*)Available only for f_{hi} up to 100MHz.

Dimensions [mm]

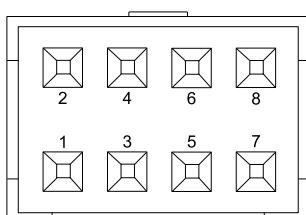
SIP-TO8



SIP-TO39



Power supply and TEC control connector - AMP2x4 connector male



Pin number	Symbol	Function
1	$-V_{sup}$	power supply input (-)
2 ^{*)}	TH2/N.C.	thermistors output/not connected
3 ^{**)}	DATA/GND	data pin/power ground
4 ^{*)}	TEC-/N.C.	TEC supply input (-)/not connected
5	GND	power ground
6 ^{*)}	TH1/N.C.	thermistors output/not connected
7	$+V_{sup}$	power supply input (+)
8 ^{*)}	TEC+/N.C.	TEC supply input (+)/not connected

^{*)}N.C for SIP- f_{lo} - f_{hi} -TO39

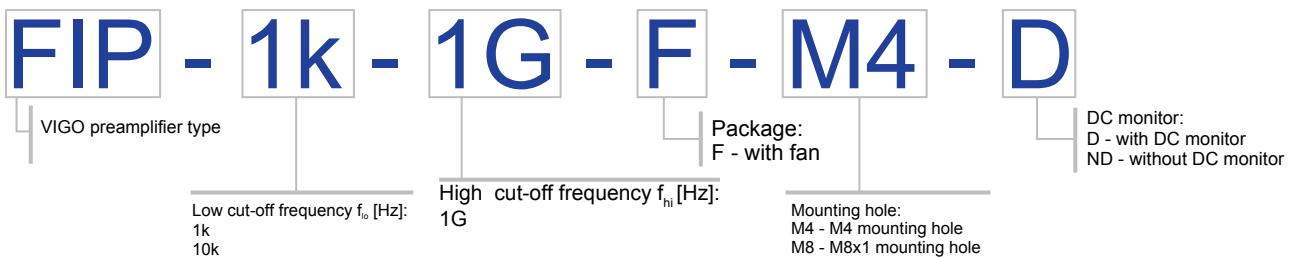
^{**) GND for SIP- f_{lo} - f_{hi} -TO39}

FIP preamplifier

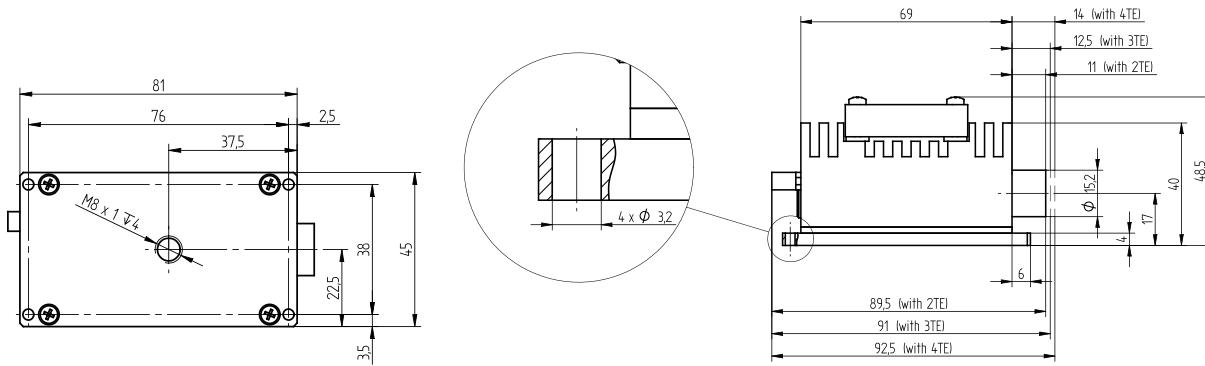


FIP is a high speed transimpedance, AC coupled preamplifier. Extremely broad bandwidth up to 1GHz guarantees quality of high speed infrared measurements. FIP preamplifier is intended to operate with either biased or non-biased TE cooled detectors. Fast preamplifier enables precise I-V conversion, detector biasing up to 800mV and simultaneously maintains compact size and keeps current noise low. FIP is suitable for laboratory usage. Additional DC output is available as an option.

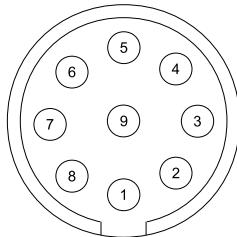
Code description



Dimensions [mm]



Power supply and TEC control connector -LEMO connector female



Pin number	Symbol	Function
1	FAN+	FAN (+)
2	TH2	thermistor output (2)
3	TEC-	TEC supply input (-)
4	$-V_{sup}$	power supply input (-)
5	GND	power ground
6	$+V_{sup}$	power supply input (+)
7	TEC+	TEC supply input (+)
8	TH1	thermistor output (1)
9	DATA	data pin

MIP preamplifier

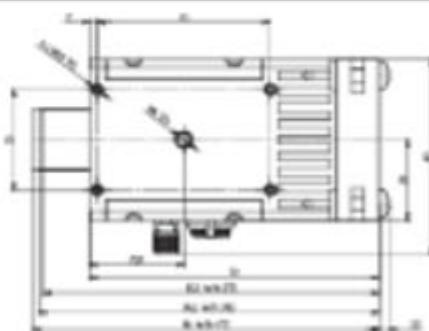
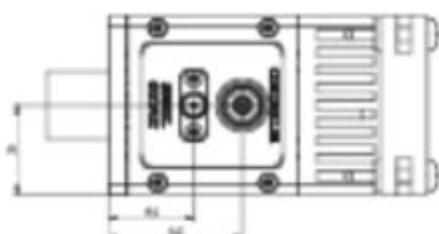


MIP is a transimpedance, AC or DC coupled preamplifier, intended to operate with either biased or non-biased detectors. It is dedicated for benchtop applications and recommended for laboratory usage. Medium-size preamplifier is a convenient device with internal built-in heat sink. MIP is integrated into package type F which is equipped with fan and does not require any additional heat sink. MIP is one of the most user-friendly preamplifiers which surely facilitate work.

Code description

MIP	-	1k	-	100M	-	F	-	M4
VIGO preamplifier type MIP		Low cut-off frequency (Hz):		High cut-off frequency (Hz):		Package:		Mounting hole:
		DC		100k		F - without		M4 - M4 mounting hole
		10		300k				M4 - M4x1 mounting hole
		100		1M				
		1k		10M				
		10k		20M				
				50M				
				100M				
				250M				

Dimensions [mm]



Power supply and TEC control connector - LEMO connector female



Pin number	Symbol	Function
1	PAN+	PAN (+)
2	TH2	thermistor output (2)
3	TEC-	TEC supply input (-)
4	-V _{sup}	power supply input (-)
5	GND	power ground
6	+V _{sup}	power supply input (+)
7	TEC+	TEC supply input (+)
8	TH1	thermistor output (1)
9	DATA	data pin

PIP preamplifier



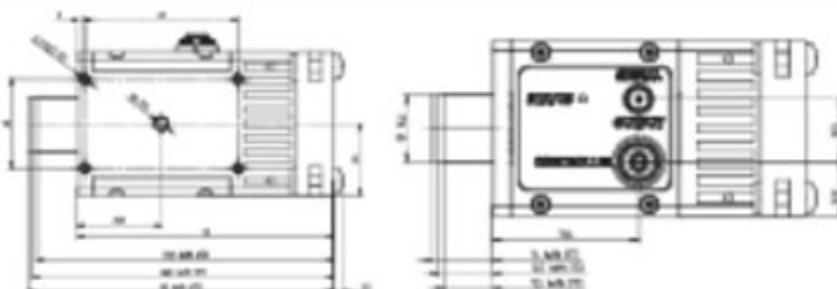
PIP is a programmable "smart" preamplifier. Due to the modern internal configuration, it offers extreme flexibility combined with superior signal parameters and high reliability. Included voltage monitor allows user to check the working conditions (supply voltages, detector bias voltage, first and last stage output voltage offset etc.)

- User may also immediately change the gain, coupling (AC/DC), optimize the first stage transimpedance (in terms of input noise and overall bandwidth), reduce the bandwidth down to 1.5 MHz (for suppressing wideband noise and convenient weak signal observation), and also manually or automatically suppress the voltage offset.
- Optimized parameters are immediately stored into the internal EEPROM memory and automatically loaded after the power is on.
- Reset to factory settings is always available, and following the manual, operation and manipulation is both: easy and safe.
- In some cases detector biasing condition may be adjusted, however, for detector safety this function is blocked in factory by default.
- For proper operation PTCC-01 TEC controller is required.

Code description



Dimensions [mm]



Power supply and TEC control connector - LEMO connector female



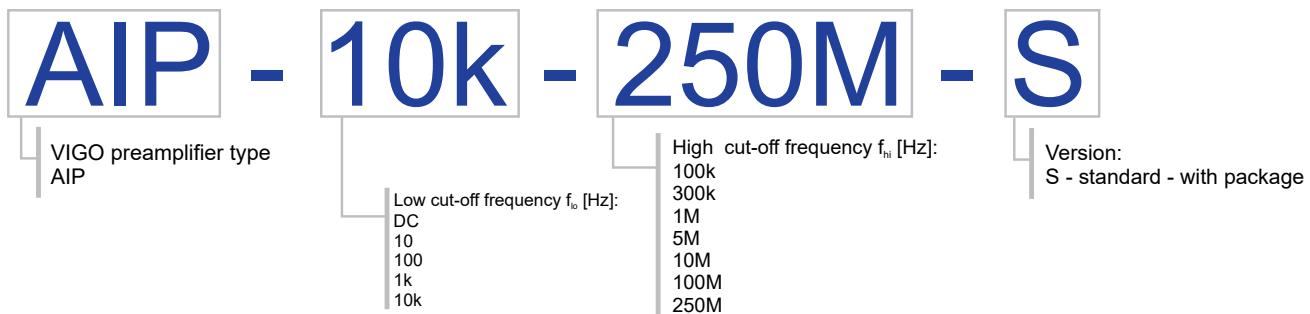
Pin number	Symbol	Function
1	FAN+	FAN (+)
2	TH2	thermistor output (2)
3	TEC-	TEC supply input (-)
4	-V _{DD}	power supply input (-)
5	GND	power ground
6	+V _{DD}	power supply input (+)
7	TEC+	TEC supply input (+)
8	TH1	thermistor output (1)
9	DATA	data pin

AIP preamplifier

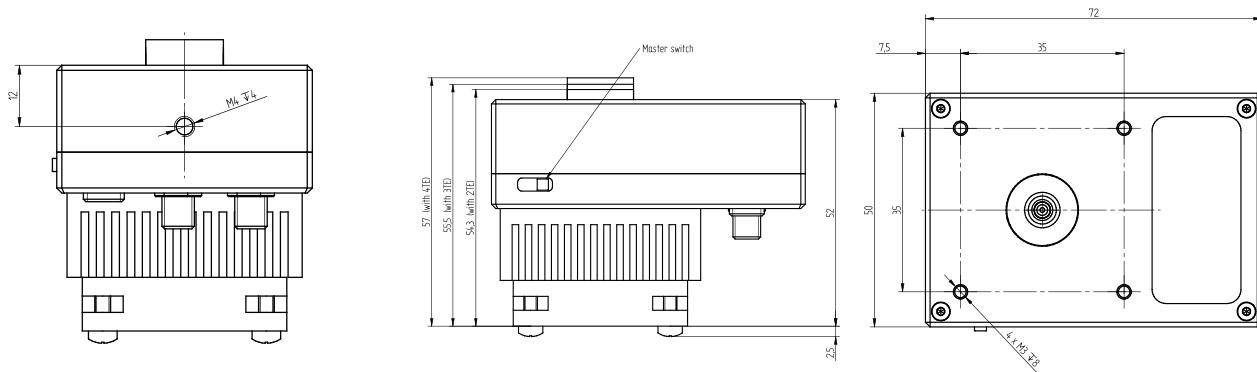


AIP is a new generation of transimpedance, AC or DC coupled preamplifier, integrated with thermoelectric cooler controller. It is designed to operate with either biased and non-biased detectors. Internal apply/voltage inverter allows to use single power supply what makes AIP very convenient in use and decreases power consumption.

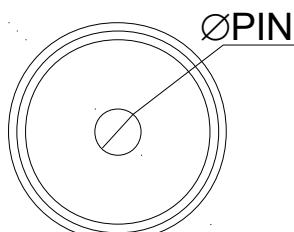
Code description



Dimensions [mm]



Power supply connector - DC Jack connector



Type	Voltage [V]	Pin diameter
DC Jack - 2.5	9 - 12	Ø 2.5
DC Jack - 2.1	5	Ø 2.1