



HEIDENHAIN



Product Information

IBV 6000 Series

Interpolation and
Digitizing Electronics

June 2016

IBV 6000 series

Interpolation and digitizing electronics

- Input $\sim 1V_{PP}$
- Two outputs \square TTL/ $\sim 1V_{PP}$ (adjustable)

The interpolation and digitizing electronics of the IBV 6000 series permit the connection of two subsequent electronic units to one encoder. By arranging the internal connections to the two output flange sockets, $\sim 1V_{PP}$ and/or \square TTL signals with various, adjustable interpolation factors can be selected. The encoder-dependent possible combinations are listed under *Selecting the output signals*



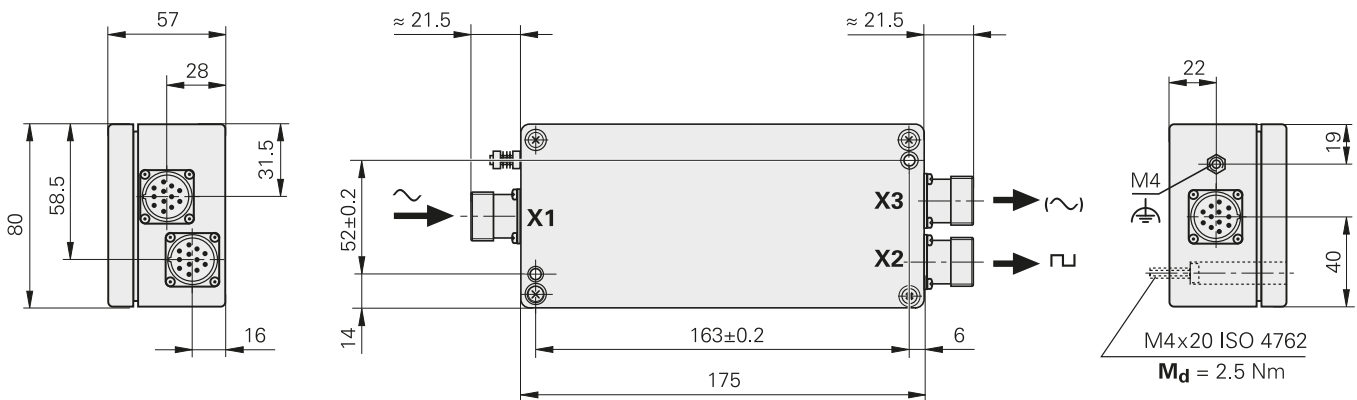
mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ± 0.2 mm



Specifications	IBV 6072 IBV 6172 IBV 6272								
Input	\sim 1 V _{PP}								
Electrical connection	M23 flange socket (female) 12-pin								
Cable length	\leq 60 m with U _P > 4.9 V \leq 30 m with I _{encoder} \leq 120 mA Note the voltage supply range of the connected encoder								
Interpolation ¹⁾	<i>IBV 6072</i> : 2-fold <i>IBV 6172</i> : 2-fold (fixed), 5-fold, 10-fold (switchable) <i>IBV 6272</i> : 2-fold ⁴⁾ (fixed), 5-fold, 10-fold (switchable), 20-fold, 25-fold, 50-fold, 100-fold (switchable)								
Input frequency ²⁾ for interpolation	2-fold	500 kHz	–	–	–	–	–	–	–
	5-fold	–	200 kHz	200 kHz	133 kHz	100 kHz	80 kHz	50 kHz	25 kHz
	10-fold	–	200 kHz	100 kHz	66 kHz	50 kHz	40 kHz	25 kHz	12.5 kHz
	20-fold	–	100 kHz	50 kHz	33 kHz	25 kHz	20 kHz	12.5 kHz	6.25 kHz
	25-fold	–	80 kHz	40 kHz	26 kHz	20 kHz	16 kHz	10 kHz	5 kHz
	50-fold	–	40 kHz	20 kHz	13 kHz	10 kHz	8 kHz	5 kHz	2.5 kHz
	100-fold	–	20 kHz	10 kHz	6.6 kHz	5 kHz	4 kHz	2.5 kHz	1.25 kHz
Outputs	\sim 1 V _{PP} and \square TTL (for possible combinations see <i>Selection of output signals</i>) The following specifications refer to \square TTL outputs								
Electrical connection	Two M23 flange sockets (male), 12-pin								
Cable length	\leq 100 m ($\overline{U_{aS}} \leq 50$ m)								
Edge separation a ¹⁾	$\geq 0.150 \mu\text{s}$	$\geq 0.100 \mu\text{s}$	$\geq 0.220 \mu\text{s}$	$\geq 0.345 \mu\text{s}$	$\geq 0.465 \mu\text{s}$	$\geq 0.585 \mu\text{s}$	$\geq 0.950 \mu\text{s}$	$\geq 1.925 \mu\text{s}$	
Reference mark signal ¹⁾	Pulse width 90° elec. (not with IBV 6072) or 270° elec.								
Fault message ¹⁾	Through fault detection signal $\overline{U_{aS}}$ or additional U _{a1} /U _{a2} high-impedance								
Voltage supply	5 V \pm 0.25 V (only via X2)								
Current consumption ³⁾	<i>IBV 6072</i> : \leq 60 mA <i>IBV 6172</i> : \leq 90 mA <i>IBV 6272</i> : \leq 130 mA								
Operating temperature	0 °C to 70 °C								
Storage temperature	–30 °C to 80 °C								
Vibration 50 to 2000 Hz	$\leq 10 \text{ m/s}^2$								
Shock 11 ms	$\leq 300 \text{ m/s}^2$								
Protection	IP65								
Mass	≈ 0.7 kg								

Bold: This version is the factory default setting

¹⁾ Adjustable

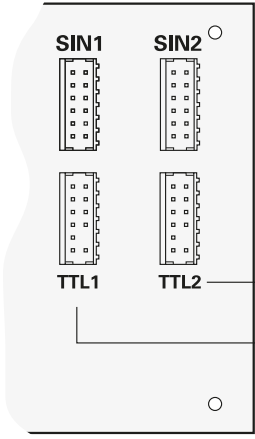
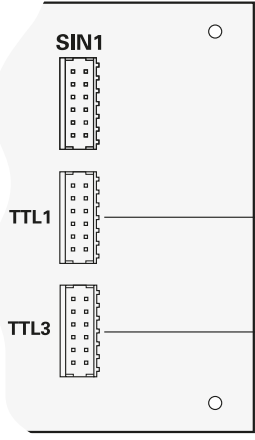
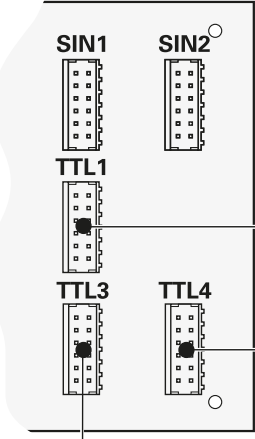
²⁾ Adjustable; nominal values, the actual input frequency can be up to 5 % lower. Exceeding this limit results in failure.

³⁾ Without current consumption by the encoder and without output load (80 mA with recommended input circuit)

⁴⁾ Without interpolation upon request

Selecting the output signals

Various output signals are available, depending on the product model. They can be assigned to the two output flange sockets by reconnecting the plug-in PCB.






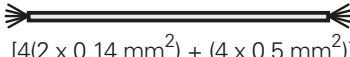
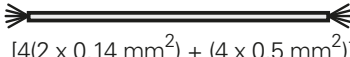


<p>IBV 6072</p> <p>Output signals 2 x \sim 1 V_{PP} and 2 x \squareTTL x 2</p> <p>Possible combinations</p> <ul style="list-style-type: none"> • \sim 1 V_{PP} and \sim 1 V_{PP} • \sim 1 V_{PP} and \squareTTL x 2 • \squareTTL x 2 and \squareTTL x 2 	 <p>SIN1 SIN2</p> <p>TTL1 TTL2</p> <p>TTL x 2</p> <p>TTL x 2</p>
<p>IBV 6172</p> <p>Output signals 1 x \sim 1 V_{PP} and 1 x \squareTTL x 2 and 1 x \squareTTL x 5 or x 10¹⁾</p> <p>Possible combinations</p> <ul style="list-style-type: none"> • \sim 1 V_{PP} and \squareTTL x 2 (see also <i>IBV 6072</i>) • \sim 1 V_{PP} and \squareTTL x 5 or x 10¹⁾ • \squareTTL x 2 and \squareTTL x 5 or x 10¹⁾ 	 <p>SIN1</p> <p>TTL1</p> <p>TTL3</p> <p>TTL x 2</p> <p>TTL x 5, TTL x 10</p>
<p>IBV 6272</p> <p>Output signals 2 x \sim 1 V_{PP} and 1 x \squareTTL and 1 x \squareTTL x 5 or x 10¹⁾ and 1 x \squareTTL x 20, x 25, x 50 or x 100¹⁾</p> <p>Possible combinations</p> <ul style="list-style-type: none"> • \sim 1 V_{PP} and \sim 1 V_{PP} (see also <i>IBV 6072</i>) • \sim 1 V_{PP} and \squareTTL x 2 • \sim 1 V_{PP} and \squareTTL x 5 or x 10 • \sim 1 V_{PP} and \squareTTL x 20, x 25, x 50 or x 100¹⁾ • \squareTTL x 2 and \squareTTL x 5 or x 10 • \squareTTL x 2 and \squareTTL x 20, x 25, x 50 or x 100¹⁾ • \squareTTL x 5 or x 10 and \squareTTL x 20, x 25, x 50 or x 100¹⁾ 	 <p>SIN1 SIN2</p> <p>TTL1</p> <p>TTL3</p> <p>TTL4</p> <p>TTL x 2²⁾</p> <p>TTL x 20, TTL x 25, TTL x 50, TTL x 100</p> <p>TTL x 5, TTL x 10</p>

¹⁾ Adjustable



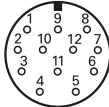


TTL; TTL x 2: Non-clocked
 TTL x 5 and higher: Clocked

²⁾ TTL upon request



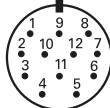

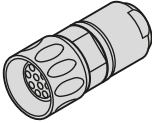





Electrical connection

Connecting cable or adapter cable with M23 connector (male) 12-pin  Cable and connector , 12-pin. See also HEIDENHAIN catalogs for linear encoders, angle encoders and rotary encoders as well as Product Information documents for the respective encoders.	Connecting cable M23 , 12-pin, \varnothing 8 mm, Cross section of supply lines $A_P = 0.5 \text{ mm}^2$	
	Complete ID 298399-xx 	
	With one connector ID 309777-xx 	
	Cable only ID 244957-01 $[4(2 \times 0.14 \text{ mm}^2) + (4 \times 0.5 \text{ mm}^2)]$ 	
	Connector (female) , 12-pin ID 291697-05 	

IBV input – $\sim 1 \text{ V}_{PP}$

12-pin flange socket M23   													
	Voltage supply				Incremental signals						Other signals		
	12	2	10	11	5	6	8	1	3	4	7	9	/
	U_P	Sensor U_P	0V	Sensor 0V	A+	A-	B+	B-	R+	R-	Vacant	Vacant	Vacant
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	/	Yellow

IBV output – \square TTL/ $\sim 1 \text{ V}_{PP}$

12-pin flange socket M23   														Mating connector: 12-pin connector, M23   			
	Voltage supply ¹⁾				Incremental signals						Other signals						
	12	2	10	11	5	6	8	1	3	4	7	/	9				
	U_P	Sensor 5V	0V	Sensor 0V	U_{a1}	\overline{U}_{a1}	U_{a2}	\overline{U}_{a2}	U_{a0}	\overline{U}_{a0}	U_{aS}	Vacant	Vacant				
	$\sim 1 \text{ V}_{PP}$				A+	A-	B+	B-	R+	R-	Vacant						
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	/	Yellow				

Cable shield connected to housing; U_P = Power supply voltage

Sensor: The sensor line is connected in the encoder with the corresponding power line.

Vacant pins or wires must not be used.


¹⁾ IBV voltage supply: Only through one of the two flange sockets; see *Mounting Instructions*


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This Product Information supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document edition valid when the order is made.

Further Information

- Product overview: *Interface Electronics*