



# HEIDENHAIN



Product Information

## **APE 371**

Interpolation and  
Digitizing Electronics

July 2006

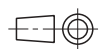
# APE 371

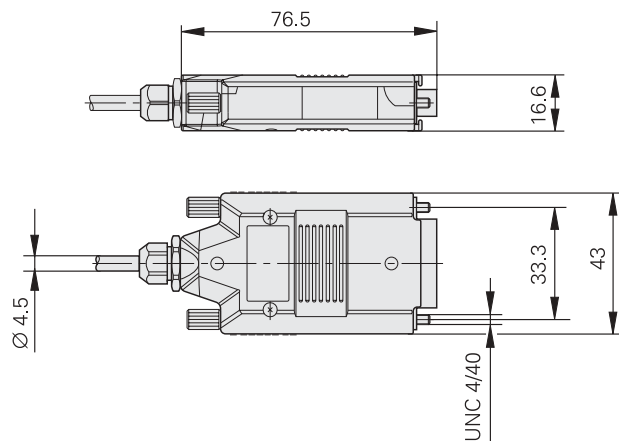
- Interpolation and Digitizing Electronics
- Interpolation up to 100-fold
- Adapter cable design with electronics in D-sub connector

Specifications		APE 371						
<b>Input</b>		Incremental signals $\sim$ 1 V <sub>PP</sub>						
Electrical connection*		<ul style="list-style-type: none"> <li>• D-sub connector (female), 15-pin</li> <li>• M23 connector (female) 12-pin</li> </ul>						
Cable length		≤ 3 m						
Input frequency <sup>1)</sup> for interpolation*	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
<b>Output</b>		Incremental signals $\square$ TTL						
Electrical connection		D-sub connector (male) 15-pin						
Cable length		≤ 100 m with HEIDENHAIN cable						
Edge separation a		≥ 0.100 μs	≥ 0.220 μs	≥ 0.345 μs	≥ 0.465 μs	≥ 0.585 μs	≥ 0.950 μs	≥ 1.925 μs
<b>Power supply</b>		5 V ± 5 % measured at APE						
<b>Current consumption</b> without load, without encoder		<i>5/10-fold interpolation: ≤ 120 mA</i> <i>20/25/50/100-fold interpolation: ≤ 130 mA</i>						
<b>Operating temperature</b>		0 to 70 °C						
<b>Storage temperature</b>		-30 to 70 °C						
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 11 ms		100 m/s <sup>2</sup> (IEC 60068-2-6) 200 m/s <sup>2</sup> (IEC 60068-2-27)						
<b>Protection</b>		IP 40						
<b>Weight</b>		140 g (APE without cable, with electronics)						

\* Please indicate when ordering


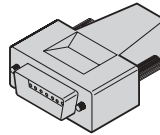
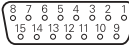

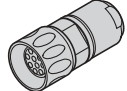
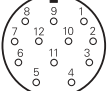



<sup>1)</sup> Tolerance: ± 5 %

  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 < 6 mm: ±0.2 mm

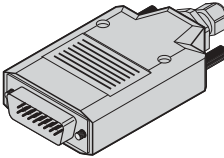
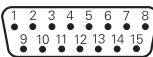




# Electrical Connection

## Pin layout of APE input

  					  								
	Power supply				Incremental signals						Other signals		
	12	2	10	11	5	6	8	1	3	4	/	7	9
	4	12	2	10	1	9	3	11	14	7	5/13/15	8	6
	$U_P$	Sensor $U_P$	0V	Sensor 0V	A+	A-	B+	B-	R+	R-	Vacant	H <sup>1)</sup> L1 <sup>2)</sup>	L <sup>1)</sup> L2 <sup>2)</sup>
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	/	Violet	Yellow

## Pin layout of APE output

<b>15-pin D-sub connector with integrated interface electronics</b>   														
	Power supply				Incremental signals						Other signals			
	4	12	2	10	1	9	3	11	14	7	13	8	6	15
	$U_P$	Sensor 5V	0V	Sensor 0V	$U_{a1}$	$\overline{U}_{a1}$	$U_{a2}$	$\overline{U}_{a2}$	$U_{a0}$	$\overline{U}_{a0}$	$\overline{U}_{aS}$	H <sup>1)</sup> L1 <sup>2)</sup>	L <sup>1)</sup> L2 <sup>2)</sup>	<sup>3)</sup>

**Shield** on housing;  $U_P$  = power supply voltage

**Sensor:** The sensor line is connected internally with the corresponding power line


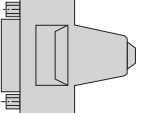
<sup>1)</sup> Only for LIF 481

<sup>2)</sup> Only for LIDA 4xx


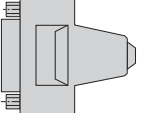
<sup>3)</sup> TTL/11  $\mu A_{PP}$  conversion for PWT






# Connecting Elements and Cables




## Encoders without limit position detection

<b>Mating element on connecting cable to connector on encoder cable</b>	<b>D-sub connector (female), 15-pin</b>
	
For connecting cable	315650-14
Ø 8 mm Ø 6 mm	

## Encoders with limit position detection

<b>Mating element on connecting cable to connector on encoder cable</b>	<b>D-sub connector (female), 15-pin</b>
	
For connecting cable	315650-14
Ø 8 mm Ø 6 mm	

<b>PUR connecting cable Ø 8 mm</b> [4(2 x 0.14 mm <sup>2</sup> ) + (4 x 0.5 mm <sup>2</sup> )] Shield on housing		
<b>PUR connecting cable Ø 6 mm</b> [6(2 x 0.19 mm <sup>2</sup> )]	Ø 8 mm	Ø 6 mm <sup>1)</sup>
<b>Complete</b> with D-sub connectors (female/male)	331 693-xx	355 215-xx
		
<b>With one</b> D-sub connector (female)	332 433-xx	355 209-xx
		
<b>Complete</b> with D-sub connectors (female/male)	335 074-xx	355 186-xx
		
<b>Complete</b> with D-sub connectors (female/female) <b>Pin layout for IK 220</b>	335 077-xx	349 687-xx
		
<b>Cable only</b>	244 957-01	291 639-01
		

<b>PUR connecting cable Ø 8 mm</b> [4(2 x 0.14 mm <sup>2</sup> ) + (4 x 0.5 mm <sup>2</sup> ) + 2 x (2 x 0.14 mm <sup>2</sup> )] Shield on housing		
<b>PUR connecting cable Ø 6 mm</b> [6(2 x AWG28) + (4 x 0.14 mm <sup>2</sup> )]	Ø 8 mm	Ø 6 mm <sup>1)</sup>
<b>Complete</b> with D-sub connectors (female/male)	354 379-xx	355 397-xx
		
<b>With one</b> D-sub connector (female)	354 411-xx	355 398-xx
		
<b>Cable only</b>	354 341-01	355 241-01
		

<sup>1)</sup> Cable length for Ø 6 mm max. 9 m

# HEIDENHAIN

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### For more information

- Brochure: *Exposed Linear Encoders*



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