

Assembly Type ABS AT Series

Absolute Scale Unit (Standard Type)

ABSOLUTE™

ABS AT300 Series



Features

- Complete absolute type linear scales.
- Easy operation because no recalibration is required at startup or after a power failure.
- Suitable for position feedback in machinery requiring high-accuracy, high-speed control.
- Compatible with servo amplifiers from a range of companies (high-speed serial interfaces).

How to read the code

ABS AT3 -

Interface specification

Effective range

Applicable systems	Scale code
FANUC Ltd. control devices FS-i Series POWER Mate i	ABS AT353
Mitsubishi Electric Corporation control devices MITSUBISHI CNC Series Applicable amplifier: MDS-D/MDS-DH Series	ABS AT343
Mitsubishi Electric Corporation MR-J4/MR-J3 Series	ABS AT343A
Amplifier compatible with the Mitutoyo ENSIS interface Nikki Denso Co., Ltd. VCII/VC/VPS Series *1 Servoland Corporation SVF Series *1 PMAC JAPAN Co., Ltd. UMAC-Turbo PMAC2 Other machine types	ABS AT303A
	ABS AT303

*1 For connection to ABS AT303A

*ABS AT33

Communication method

Blank: Full-duplex communication

A: Half-duplex communication

* For details regarding the applicable system, please consult with the individual manufacturer.

Specifications

Item	Code	ABS AT353/AT343(A)/AT303(A)
Detection method		Electrostatic capacitance type / photoelectric type composite ABS linear encoder
Effective range		100 to 3000mm
Resolution		0.05 μm
Maximum response speed		120m/min (2m/s)
Accuracy (20°C)		100 to 1500mm: (3+3L ₀ /1000) μm 1600 to 3000mm: (5+5L ₀ /1000) μm L ₀ : Effective range (mm)
Thermal expansion coefficient		(8.0±1) x 10 ⁻⁶ /°C
Vibration resistance		98m/s ² (10G) (half-sine, 11ms)
Shock resistance		147 m/s ² (15G) (55 to 2000Hz)
Power supply voltage		DC5V±5%
Maximum current consumption		250mA (Max)
Maximum sliding force		5N
Operating temperature/humidity		0 to 45°C, 20 to 80%RH (no condensation)
Storage temperature/humidity		-20 to 70°C, 20 to 80%RH (no condensation)
Protection rating		Equivalent to IP53
Signal cable length*		5m

* The AT343A signal cable is sold as an option.

0.2 m: **No.09BAA598A**

2 m: **No.09BAA598B**

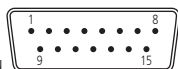
3 m: **No.09BAA598C**

Mitutoyo

Output specification

• ABS AT353/AT343/AT303

Output connector (pin type): HDAB-15P (Hirose Electric)
Applicable connector (included): HDAB-15S (Hirose Electric)
Alternately, an equivalent product (D-sub series) can be used.

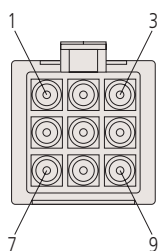


Pin No.	Signal
1	0V (GND)
2	0V (GND)
3	+5V
4	+5V
5	DT
6	DT
7	REQ
8	REQ
9	Phase A (for testing)
10	Phase B (for testing)
11	+5V
12	N.C
13	0V (GND)
14	N.C
15	F.G
Connector shell	F.G

Note: Phase A and Phase B are used as test signals.
Keep them disconnected during use.

• ABS AT343A

Output connector (pin type): Tyco Electronics Japan
Mini•Universal Mate-N-Lock Connector 9P
172169-9 (Housing: Black)
Applicable connector: 172161-9 (Housing: Black)

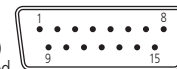


Pin No.	Signal
1	MR (RQ/DT)
2	MRR(RQ/DT)
3	N.C
4	(DT)
5	(DT)
6	N.C
7	P5 (+5V)
8	LG (GND)
9	F.G

Note: Phase A and Phase B are used as test signals.
Keep them disconnected during use.

• ABS AT303A

Output connector (pin type): HDAB-15P (Hirose Electric)
Applicable connector (included): HDAB-15S (Hirose Electric)
Alternately, an equivalent product (D-sub series) can be used.

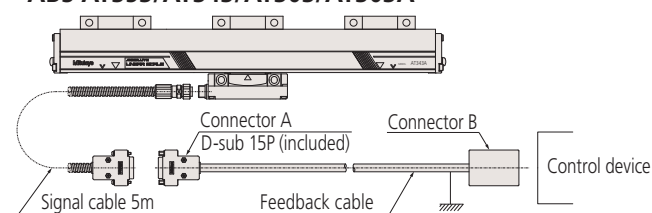


Pin No.	Signal
1	0V (GND)
2	0V (GND)
3	+5V
4	+5V
5	—
6	—
7	REQ/DT
8	REQ/DT
9	Phase A (for testing)
10	Phase B (for testing)
11	+5V
12	N.C
13	0V (GND)
14	N.C
15	F.G
Connector shell	F.G

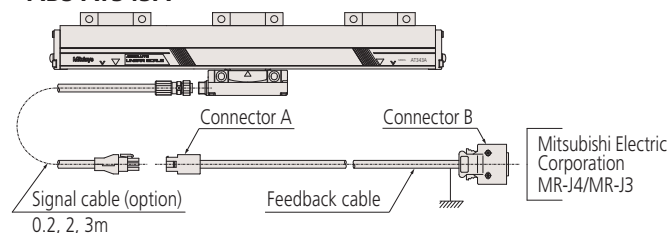
Note: Phase A and Phase B are used as test signals.
Keep them disconnected during use.

System configuration (See instruction manual)

• ABS AT353/AT343/AT303/AT303A



• ABS AT343A



Notes

1. Connector B and the feedback cable are to be prepared by the user.
2. Connectors A/B and the grounding bar are to be connected by the user.
3. When fabricating a feedback cable, ensure that the total cable length is 25m or less.

Notes

1. Connectors A/B and the feedback cable are to be prepared by the user.
2. Connectors A/B and the grounding bar are to be connected by the user.
3. A Mitsubishi Electric Corporation encoder cable can be used as the feedback cable.
MR-J4/MR-J3 series compatible model: MREKCB□M-H
□ indicates the cable length (2, 5, 10m)
* Depending on the signal cable length, the encoder cable length is restricted as follows.
Signal cable 0.2 m: 2, 5, 10m
Signal cable 2m: 2, 5m
Signal cable 3m: 2m
* The feedback cable configuration depends on the system. Please contact Mitsubishi Electric Corporation for details.

Unit: mm

[illegible]

Signal cable
(PVC sheathed type)

L

(16)

(42)

*The signal cable has set options.
(Part No.09BAA598A - C: 0.2m, 2m, 3m)

Technical drawing of the MLC1000 absolute linear scale system, showing dimensions and components.

Scale unit mounting surface:

- Overall width: 32.5
- Mounting hole pitch: 23
- Mounting hole diameter: $\phi 15$
- Mounting hole spacing: 50.5
- Mounting hole diameter: $\phi 29$
- Mounting hole spacing: 1.5 $\pm$ 0.2
- Mounting hole diameter: $\phi 36$
- Mounting hole spacing: 0.1 A

Detector head mounting surface:

- Overall width: 80
- Mounting hole pitch: 60 $\pm$ 0.2
- Mounting hole diameter: $\phi 8$
- Mounting hole spacing: 15
- Mounting hole diameter: $\phi 1.5 \pm 0.2$
- Mounting hole spacing: 66 $\pm$ 0.3
- Mounting hole diameter: $\phi 7$
- Mounting hole spacing: 7.5
- Mounting hole diameter: $\phi 7$
- Mounting hole spacing: 12.6
- Mounting hole diameter: $\phi 11.6$
- Mounting hole spacing: 60 $\pm$ 0.2
- Mounting hole diameter: $\phi 90$
- Mounting hole spacing: 42
- Mounting hole diameter: $\phi 41.2$
- Mounting hole spacing: 46.3
- Mounting hole diameter: $\phi 0.5$
- Mounting hole spacing: 10.5
- Mounting hole diameter: $\phi 6.5$ (countersunk depth)

Mounting block fixing pitch L4:

- Mounting block
- Elastically secured portion
- Rigidly fixed portion

Signal cable / 5m (Flexible metal type):

- Signal cable
- Signal cable / 5m (Flexible metal type)

Effective range L0:

- Effective range L0

Maximum travel length L1:

- Maximum travel length L1

Other dimensions:

- 7
- 7.5
- 1.5 $\pm$ 0.2
- 66 $\pm$ 0.3
- 7
- 7.5
- 12.6
- 11.6
- 60 $\pm$ 0.2
- 90
- 42
- 41.2
- 46.3
- 0.5
- 10.5
- 6.5

Labels:

- Mitutoyo
- ABSOLUTE LINEAR SCALE
- MODEL AT353

Notes:

- G: Machine guideway

Effective range L ₀ (mm)	Maximum travel length L ₁ (mm)	Overall length L ₂ (mm)	Mounting block pitch		No. of mounting blocks
			L ₃ (mm)	L ₄ (mm)	
100	120	230	65	100	2
150	170	280	65	150	
200	220	330	65	200	
250	270	380	65	250	
300	330	440	220	150	
350	380	490	245	175	3
400	430	540	270	200	
450	480	590	295	225	
500	540	650	325	250	
600	650	760	380	300	
700	760	870	435	350	
750	810	920	460	375	
800	860	970	485	400	
900	960	1070	535	450	
1000	1060	1170	585	500	

Effective range L ₀ (mm)	Maximum travel length L ₁ (mm)	Overall length L ₂ (mm)	Mounting block pitch		No. of mounting blocks
			L ₃ (mm)	L ₄ (mm)	
1100	1160	1270	635	275	5
1200	1260	1370	685	300	
1300	1360	1470	735	325	
1400	1460	1570	785	350	
1500	1560	1670	835	375	
1600	1690	1800	900	400	
1700	1790	1900	950	425	
1800	1890	2000	1000	450	
2000	2100	2210	1105	335	7
2200	2300	2410	1205	370	
2400	2500	2610	1305	400	
2500	2600	2710	1355	315	9
2600	2700	2810	1405	325	
2800	2900	3010	1505	350	
3000	3050	3210	1605	375	

Codes and Order Numbers

• ABS AT353

Order No.	Code	Order No.	Code
539-541-30	AT353- 100	539-558-30	AT353-1100
539-542-30	AT353- 150	539-559-30	AT353-1200
539-543-30	AT353- 200	539-560-30	AT353-1300
539-544-30	AT353- 250	539-561-30	AT353-1400
539-545-30	AT353- 300	539-562-30	AT353-1500
539-546-30	AT353- 350	539-563-30	AT353-1600
539-547-30	AT353- 400	539-564-30	AT353-1700
539-548-30	AT353- 450	539-565-30	AT353-1800
539-549-30	AT353- 500	539-566-30	AT353-2000
539-551-30	AT353- 600	539-567-30	AT353-2200
539-553-30	AT353- 700	539-568-30	AT353-2400
539-554-30	AT353- 750	539-569-30	AT353-2500
539-555-30	AT353- 800	539-570-30	AT353-2600
539-556-30	AT353- 900	539-571-30	AT353-2800
539-557-30	AT353-1000	539-572-30	AT353-3000

• ABS AT343/AT343A

Order No.	Code	Order No.	Code
539-601-□□	AT343(A)-100	539-618-□□	AT343(A)-1100
539-602-□□	AT343(A)-150	539-619-□□	AT343(A)-1200
539-603-□□	AT343(A)-200	539-620-□□	AT343(A)-1300
539-604-□□	AT343(A)-250	539-621-□□	AT343(A)-1400
539-605-□□	AT343(A)-300	539-622-□□	AT343(A)-1500
539-606-□□	AT343(A)-350	539-623-□□	AT343(A)-1600
539-607-□□	AT343(A)-400	539-624-□□	AT343(A)-1700
539-608-□□	AT343(A)-450	539-625-□□	AT343(A)-1800
539-609-□□	AT343(A)-500	539-626-□□	AT343(A)-2000
539-611-□□	AT343(A)-600	539-627-□□	AT343(A)-2200
539-613-□□	AT343(A)-700	539-628-□□	AT343(A)-2400
539-614-□□	AT343(A)-750	539-629-□□	AT343(A)-2500
539-615-□□	AT343(A)-800	539-630-□□	AT343(A)-2600
539-616-□□	AT343(A)-900	539-631-□□	AT343(A)-2800
539-617-□□	AT343(A)-1000	539-632-□□	AT343(A)-3000

*The □□ in the Order No. is as follows. AT343 : 30
AT343A : 31

• ABS AT303/AT303A

Order No.	Code	Order No.	Code
539-321-□□	AT303(A)-100	539-336-□□	AT303(A)-1100
539-322-□□	AT303(A)-150	539-337-□□	AT303(A)-1200
539-323-□□	AT303(A)-200	539-338-□□	AT303(A)-1300
539-324-□□	AT303(A)-250	539-339-□□	AT303(A)-1400
539-325-□□	AT303(A)-300	539-340-□□	AT303(A)-1500
539-326-□□	AT303(A)-350	539-341-□□	AT303(A)-1600
539-327-□□	AT303(A)-400	539-342-□□	AT303(A)-1700
539-328-□□	AT303(A)-450	539-343-□□	AT303(A)-1800
539-329-□□	AT303(A)-500	539-344-□□	AT303(A)-2000
539-330-□□	AT303(A)-600	539-345-□□	AT303(A)-2200
539-331-□□	AT303(A)-700	539-346-□□	AT303(A)-2400
539-332-□□	AT303(A)-750	539-347-□□	AT303(A)-2500
539-333-□□	AT303(A)-800	539-348-□□	AT303(A)-2600
539-334-□□	AT303(A)-900	539-349-□□	AT303(A)-2800
539-335-□□	AT303(A)-1000	539-350-□□	AT303(A)-3000

*The □□ in the Order No. is as follows. AT303 : Blank
AT303A : 01