

Sub micron feedback stage FS-X

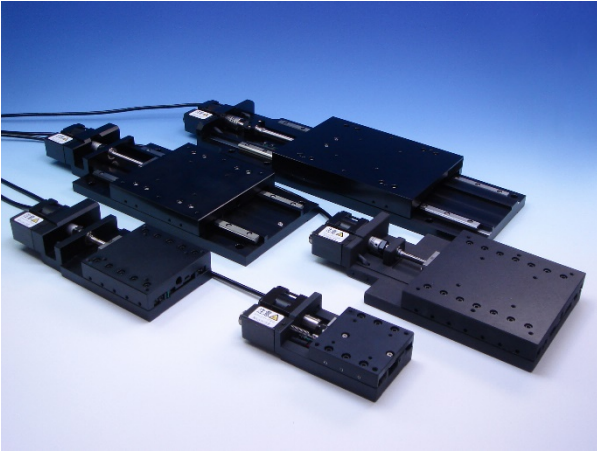
RoHS

FS-X is feedback stage with sub-micron resolution positioning.

In-house optical linear encoder are built-in at the center of stage to detect position.

Positioning to target position, positioning repeatability and holding the position with high resolution is achieved by feedback control using position information of encoder.

There are seven types of the stages. It is ideal for collecting the data in a wide range or for performing precise positioning and movement of a sample on a single stage by the large travel range.



Applicable controller and cable

Controller	FC-411
Cable	PM-CA

Specifications			FS-1020X	FS-1050X	FS-1100X	FS-3150X
Part number						
Mechanical spec	Travel [mm]		20	50	100	150
	Size of the stage [mm]		60×60	120×120	120×120	120×170
	Feed screw [mm]		Ball screw dia.4, 1mm lead	Ball screw dia.6, 1mm lead	Ball screw dia.6, 1mm lead	Ball screw dia.8, 1mm lead
	Positioning slide		Crossed roller	Crossed roller	LM guide	LM guide
	Primary material		Aluminum			
	Finish		Black anodized			
	Motor type		□28mm 5 phase stepping motor			
	Weight [kg]		0.5	1.6	2.1	2.8
Accuracy spec	Minimum resolution [nm] ※1	FC-411	50	50	50	50
		FC-414	-	-	-	-
	Positioning repeatability [nm] ※1	FC-411	+/- 100	+/- 100	+/- 100	+/- 100
		FC-414	-	-	-	-
	Load capacity [N]		49(5kgf)	98(10kgf)	98(10kgf)	98(10kgf)
	Running parallelism[μm]		10	10	10	10※2
Max speed [mm/sec]		10	10	10	10	
Sensor	Limit sensor		Equipped	Equipped	Equipped	Equipped
	Slow down sensor		None	None	None	None
	Origin sensor		None	None	None	None
	Proximity origin sensor		None	None	None	None
Equipped scale	Signal cycle		4μm	4μm	4μm	4μm
	Scale cable (※3)		2m	2m	2m	2m

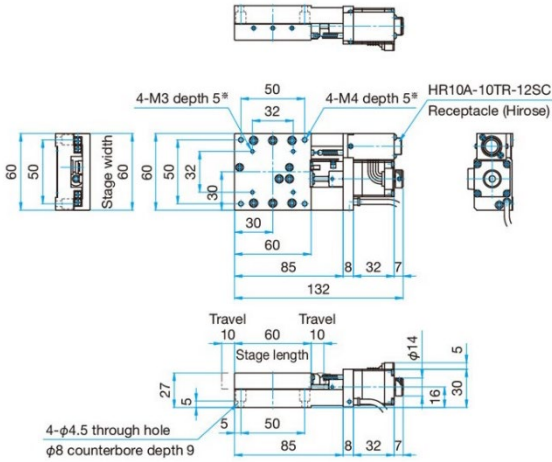
※1 : Minimum resolution and position repeatability accuracy for built-in scale read.

※2 : Running parallelism per 100mm travel.

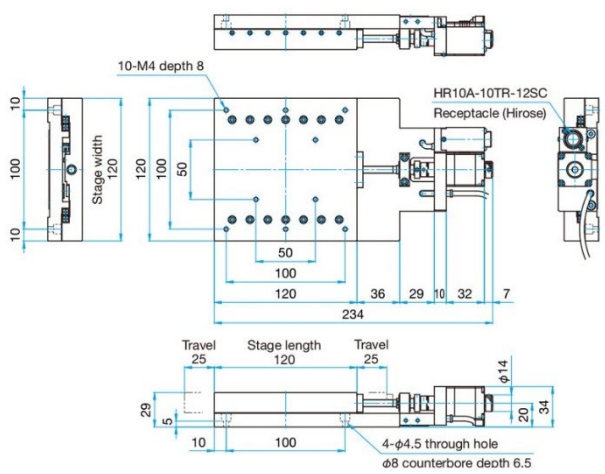
※3 : Scale cable comes directly out of the stage. Please prepare "extension cable for scale" separately if 2m or longer cable are needed.

Outline drawing

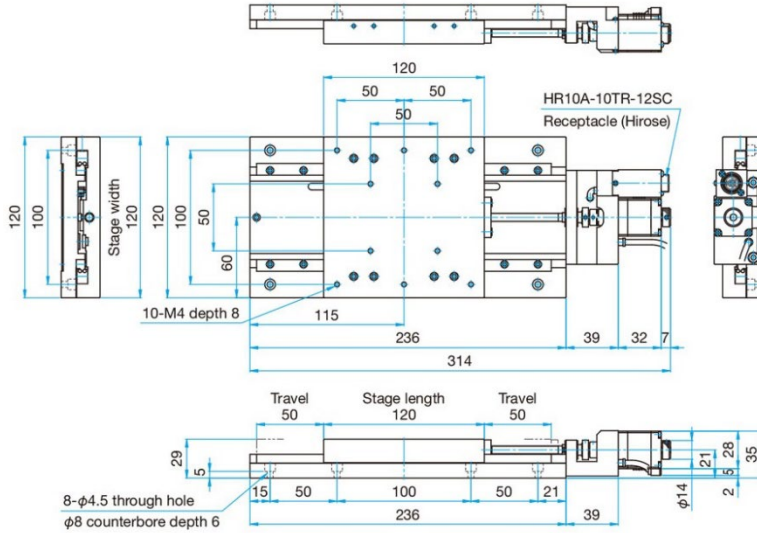
FS-1020X



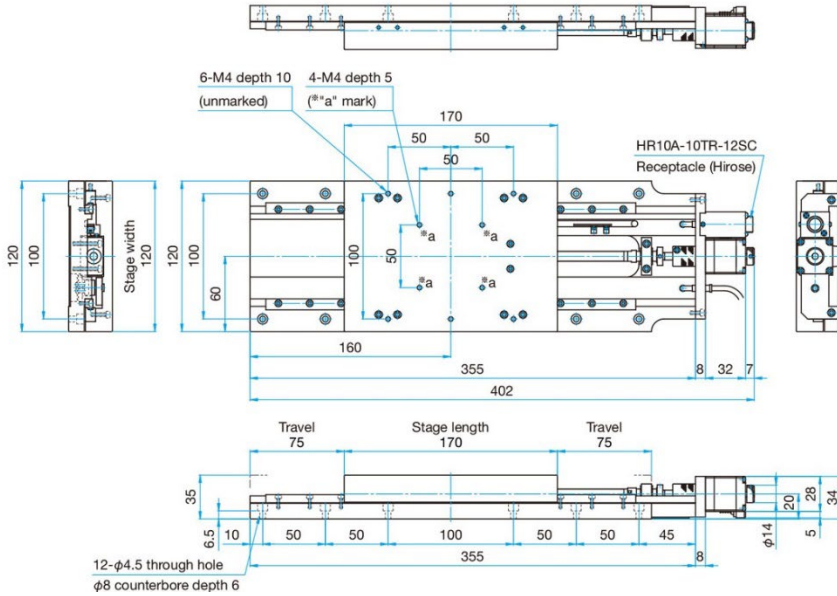
FS-1050X



FS-1100X

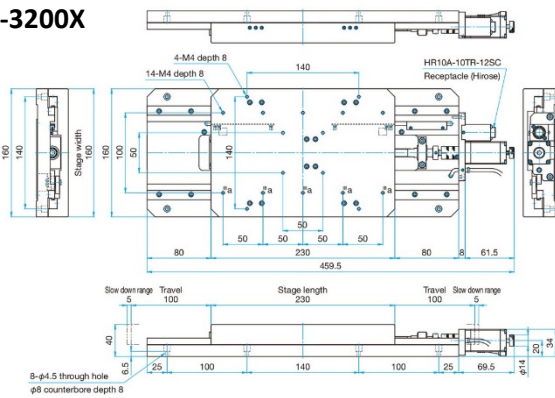


FS-3150X

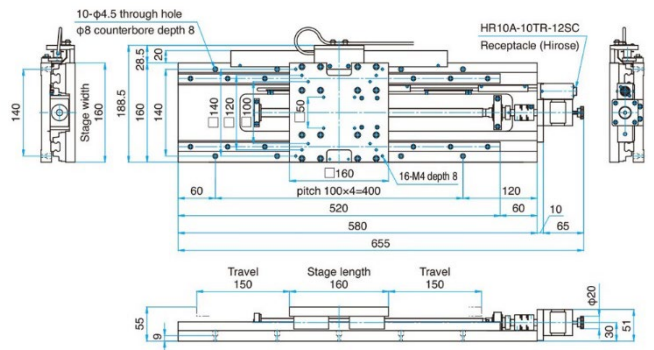


Outline drawing

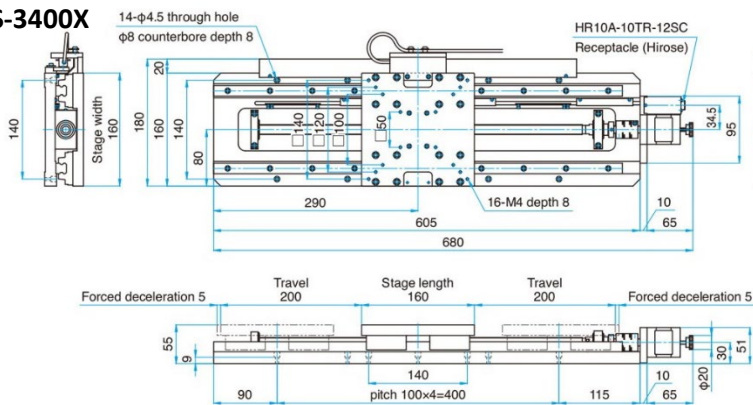
FS-3200X



FS-3300X



FS-3400X



Applicable controller and cable

Controller	FC-414
Cable	PM4N-CA-*SD

Specifications		FS-3200X	FS-3300X	FS-3400X
Part number				
Mechanical spec	Travel [mm]	200	300	400
	Size of the stage [mm]	160×230	160×160	160×160
	Feed screw [mm]	Ball screw dia. 10, 2mm lead	Ball screw dia. 14, 5mm lead	Ball screw dia. 14, 5mm lead
	Positioning slide	LM guide	LM guide	LM guide
	Primary material	Aluminum		
	Finish	Black anodized		
	Motor type	□28mm 5 phase stepping motor	□42mm 5 phase stepping motor	
Weight [kg]	5	8.5	9.5	
Accuracy spec	Minimum resolution [nm] ※1	FC-411 - FC-414 50	- 50	- 50
	Positioning repeatability [nm] ※1	FC-411 - FC-414 +/- 100	- +/- 100	- +/- 100
	Load capacity [N]	196(20kgf)	196(20kgf)	196(20kgf)
	Running parallelism[μm]	10※2	10※2	10※2
	Max speed [mm/sec]	10	20	20
Sensor	Limit sensor	Equipped	Equipped	Equipped
	Slow down sensor	Equipped	Equipped	Equipped
	Origin sensor	None	None	None
	Proximity origin sensor	None	None	None
Equipped scale	Signal cycle	4μm	4μm	4μm
	Scale cable (※3)	2m	2m	2m

※1 : Minimum resolution and position repeatability accuracy for built-in scale read.

※2 : Running parallelism per 100mm travel.

※3 : Scale cable comes directly out of the stage. Please prepare "extension cable for scale" separately if 2m or longer cable are needed.

FS-X dedicated controller for Sub micron feedback stage **FC-411/FC-414** **RoHS**

Dedicated controller for sub micron feedback stage (FS-X series) to control with sub micron resolution. Highly safe and easy to operate with various error detection functions, general-purpose I / O, and teaching functions.



Specification			FC-411	FC-414	
Part number					
Primary spec	Number of control axis		2		
	Minimum command unit		50nm		
	In position range		+/- 50nm (+/- 150, +/- 350nm selectable)		
	Max operating speed set value		100mm/sec		
	Max travel range set value		-6710.88640~+6710.88635mm		
	Number of control interface port	Jog controller		1	
		Emergency stop		1	
		GP-IB		1	
		USB		1	
		Ethernet		1	
General I/O		1			
Teaching	Number of register channel		5		
	Number of registered lines per channel		200		
	Operational interface		Controller key operation		
			Jog control key operation		
		Communication command			
		General I/O			
General spec	Power voltage		AC100~240V 50/60Hz		
	Power supply voltage fluctuation allowable range		AC90V~264V		
	Power consumption		110VA		
	Fuse		250V, 2.5A, time lag, 2		
	Outer dimensions (W×H×Dmm)		W220×H88×D290mm		
	Weight [kg]		5.2		
	Operating temperature/humidity		0 deg.C to 40 deg.C / 20% to 80%RH(without condensation)		
	Storage temperature/humidity		-10deg.C to 55 deg.C / 20%~80%RH (without condensation)		
	Connectable option		JC-01		
	Slow down sensor input		N/A	Applicable	
	Communication port	GP-IB	Address	1~30	
			Delimiter	CR+LF, EOI, CR, LF	
			Service request	Valid or invalid	
		USB	Flow control	None (fixed)	
			Function	Virtual COM port	
			Transfer speed	Full speed transfer (12Mbps max)	
		Ethernet	Delimiter	CR+LF, CR, LF	
			Standard	IEEE802.3x standard flow control compliant	
			Transfer speed	10Mbps and 100Mbps	
	General I/O port	Input	Delimiter	CR+LF, CR, LF	
General input			3 port		
Teaching			1 set		
Output		Busy error cancel	1 set		
		General output	3 port		
		Scale division pulse signal	1 set for each axis		
		Alarm signal	1 set for each axis		
In position signal	1 set for each axis				
Teaching status	1 set				
Emergency stop input		B contact (fixed)			

Jog controller JC-01

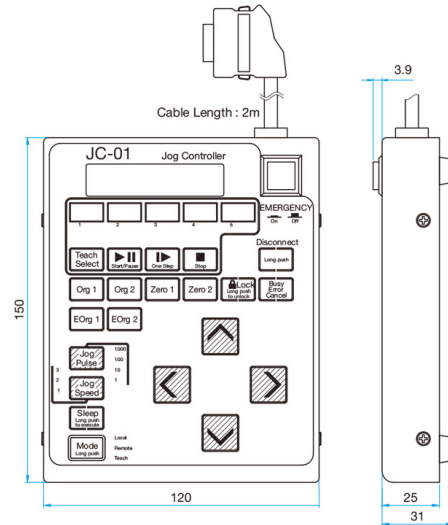
RoHS

JC-01 is used by connecting the feedback controller of feedback stage(FS series).
 JC-01 can be operated at hand by connecting a dedicated controller (FC series).
 It allows stage operation, teaching operation, emergency stop, mode switching or run sleep.

Outline drawing



JC-01



Specification		JC-01	
Part number		JC-01	
Primary spec	Controller connection number	1	
	Controller	FC-911、FC-611、FC-511、FC-514、FC-411、FC-414	
	Number of control axis	2 axes (Simultaneous control available)	
	Stage operation		Cross JOG operation, JOG speed step switching, JOG command pulse amount switching
			Mechanical origin return, electrical origin return
			Coordinate value zero clear, busy error cancel
	Teaching	Select teaching channel, execute start, pause or one step	
Others		Execute and stop	
		Mode switching, run sleep, key operation invalid, power supply cut off	
		Emergency stop	
General spec	Power voltage	DC5V	
	Weight [kg]	0.8	
	Outer dimensions (W×H×Dmm)	120×31×150	
	Cable length [m]	2	
	Operating temperature/humidity	0 deg.C to 40 deg.C / 20% to 80%RH (without condensation)	
	Storage temperature/humidity	-10deg.C to 55 deg.C / 20%~80%RH (without condensation)	

Cable for feedback stage F-CABLE



Dedicated cables for feedback stage system.

The cables are Lead free and susceptible to noise by a braided shield robot cable.

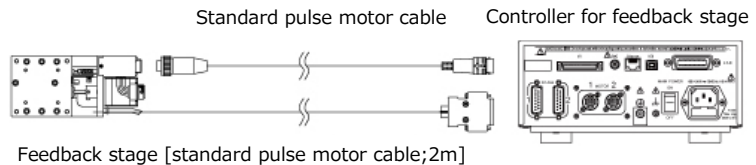
Both the cable for motor and scale are required to connect the feedback stage and dedicated controller.

Please refer the connection example to select the cable.

■ Connection example

Minimum configuration to connect stage and controller. It consists of standard pulse motor cable (2m) and scale cable (2m) directly connected with stage.

Standard pulse motor cable is required other than stage and controller.

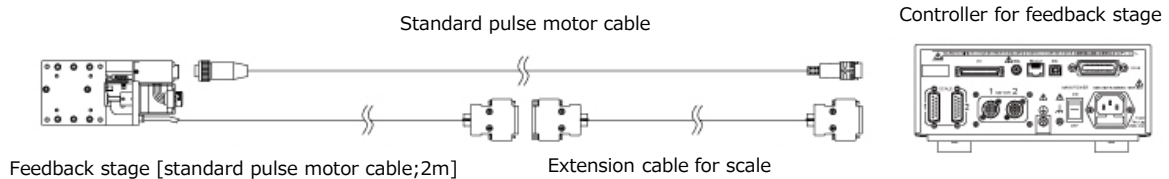


■ Extend cable configuration

[To extend the cable longer than 2m]

It consists of standard pulse motor cable (5m), scale cable (2m) directly connected with stage and extension cable (3m) for scale.

Standard pulse motor cable and extension cable for scale are required other than stage and controller.



■ Standard pulse motor cable

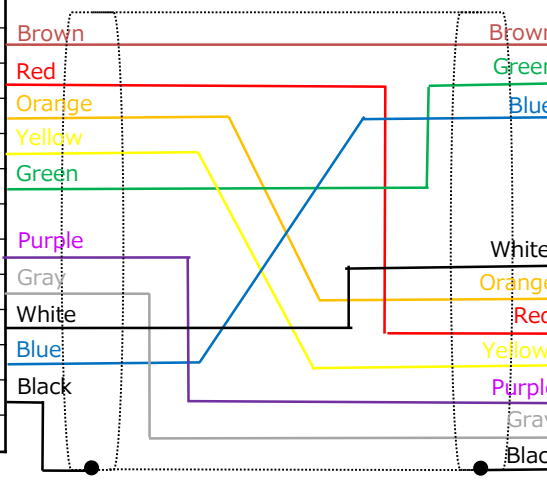
Specifications		
Part Number	PM-CA-2	PM-CA-5
Cable length [m]	2	5
Controller	FC-411、FC-511、FC-611、FC-911	
Stage	FS-1020***、FS-1050***、FS-1100***、FS-3150***	

Controller side (12pin)
RP17-13P-12PC(Hirose Electric Co., Ltd.)

Pin Number	
1	Motor lead
2	Motor lead
3	Motor lead
4	Motor lead
5	Motor lead
6	N.C
7	+Vs
8	GND
9	LS1(CCW)
10	LS2(CW)
11	F.G
12	N.C

Stage side (12pin)
HR10A-10TP-12PC
(Hirose Electric Co., Ltd.)

Pin Number	
1	Motor lead
2	Motor lead
3	LS2(CW)
4	N.C
5	N.C
6	N.C
7	LS1(CCW)
8	Motor lead
9	Motor lead
10	Motor lead
11	+Vs
12	GND

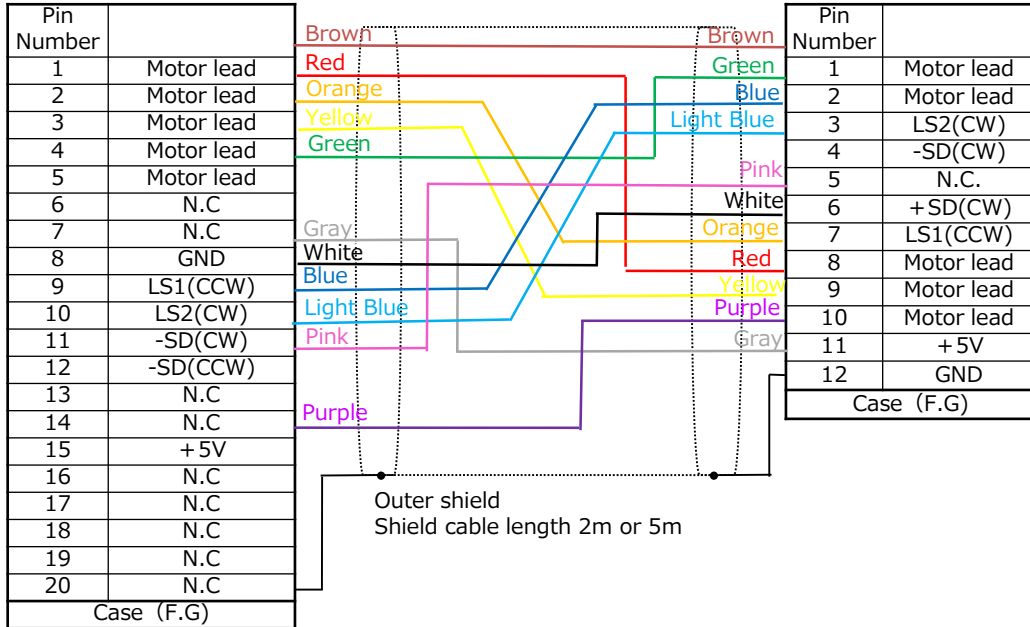


Outer shield
Shield cable length 2m or 5m

■ Cable for pulse motor (for the stage with slow down sensor)

Controller side (D-sub 20pin)
HR10A-13P-20PC (73)
Hirose Electric Co., Ltd.

Stage side (D-sub 12pin)
HR10A-10TP-12PC
Hirose Electric Co., Ltd.

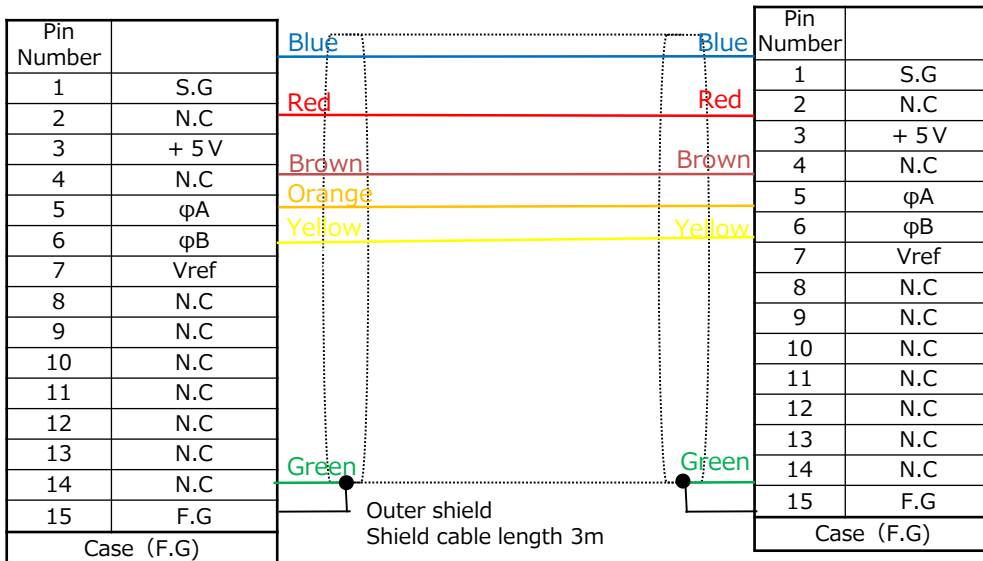


Specifications		
Part Number	PM4N-CA-2SD	PM4N-CA-5SD
Cable length [m]	2	5
Controller	FC-414, FC-514	
Stage	FS-3200**, FS-3300, FS-3400	

■ Extension cable for scale

Controller side (D-sub 15pin)
17JE-23150-02(D1)
(Male Type) DDK Ltd.

Stage side (D-sub 15pin)
17JE-13150-02(D1)
(Female Type) DDK Ltd.



Specification	
Part number	PS-EX-3
Cable length [m]	3
Stage controller	FC-911, FC-611, FC-511, FC-514, FC-411, FC-414
Feedback stage	Scale cable