



INDUSTRIAL JOYSTICK CONTROLLERS,
POTENTIOMETERS, HALL EFFECT
SENSORS & FOOTPEDALS



Your expert partner in sensors & controls

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ALTHEN
SENSORS & CONTROLS



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INFORMATION ABOUT ALTHEN SENSORS & CONTROLS

Althen Sensors & Controls stands for pioneering measurement and sensor solutions. We accept every measurement challenge. We are constantly looking for innovation and are only satisfied when we have found the perfect solution for your measurement task. We develop customer-specific solutions in our in-house production facilities. Althen is partner to many recognized universities and leading organizations. We find ourselves in an intensive knowledge transfer, developing future technologies. Althen is one of the first companies in its branch with a certification by the German technical inspection association in Hessen (TÜV PROFICERT) in accordance with DIN EN ISO 9001:2008.

The right sensor and measurement technology solution for your requirements: We at Althen draw on decades of experience to develop products ranging from standard and customised sensors to complete measuring systems for our customers. Focus is always on benefitting the customer: so you get the best solution for your measurement requirements. Our product range covers all physical quantities and

diverse technologies for measuring them. Thanks to our lengthy experience, our technical know-how, our strong team of engineers with various professional backgrounds and our wide range of products we can offer the most efficient solutions for nearly all applications in all branches of industry.

 bar	Pressure	 mm	Displacement	 g	Acceleration	 Signal conditioning
 N	Force	 α	Rotation	 m/s^2	Vibration	 Data logger
 Nm	Torque	 Joystick		 $^{\circ}/\text{s}$	Angular rate	 Automation
 ϵ	Strain	 Inclination		 $^{\circ}\text{C}$	Temperature	 Measurement systems

A company of Broadporte Holding NV

Broadporte Holding NV was founded in 2001 in the Netherlands. The holding is active in various business areas with a focus on technology. 'A very different approach, with very different results' Further information can be found at: broadporte.com



NEWLY RELEASED PRODUCTS

SMALLEST FINGERTIP JOYSTICK CONTROLLER



MODEL H25JBM

- Very small-sized, joystick controller for industrial use, which accomplished long life-expectancy, high reliability and robustness.
- This model can be assembled from both above and under the panel.
- Possible to be mounted on our cobra shaped knob.
- 2 types of knobs are available.

CONTACTLESS MULTI-TURN HALL EFFECT SENSOR



MODEL HSM22M

- 10 turn type is developed with hall effect IC potentiometer.
- 3600° linear output is achieved with this compact size (22.5Ø).
- Very long life (20 times stronger than 10 turn, contact type models).
- Several special outputs are available (Dual, Dual Independent, PWM).
- Applied voltage: 12V or 24V is available as an option.

MINI COBRA JOYSTICK CONTROLLER



MODEL HMC60JHK

- Joystick controller with the mini-cobra shaped knob, which is the down sized version of our cobra shaped knob (C90J model).
- Dead-man switch is available on the knob for safety design.
- Several switches and potentiometers can be assembled.
- Possible to mount on (H)90JA, (H)90JB, and (H)50JC models in addition to H60JH.

LINEAR HALL EFFECT SENSOR

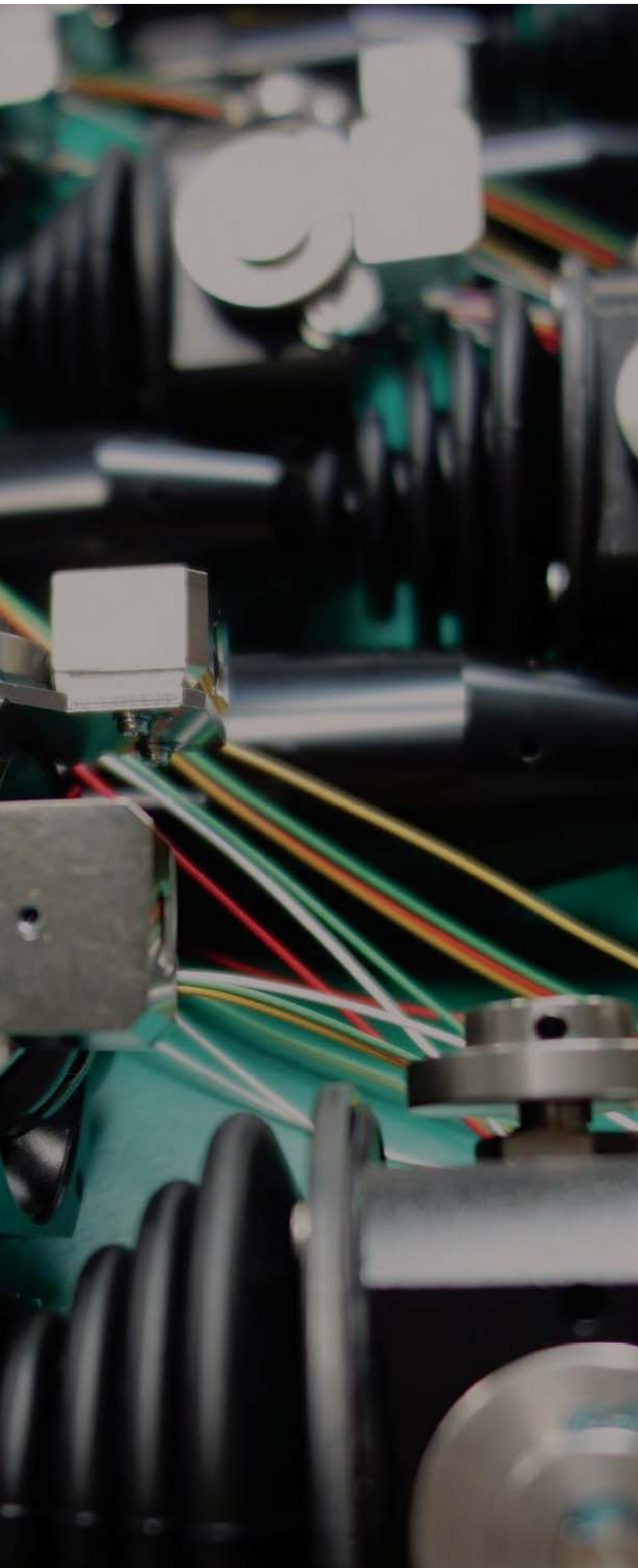


MODEL LHK15

- This is a linear-motion Contactless Potentiometer which is based on our own technical know-how through development of inductance type linear-motion Contactless Potentiometer and Hall effect IC type 1-turn Potentiometer.
- Index of Protection IP65
- Best suitable at any applications to detect the position of linear-motion displacement.
- Dual output and dual independent output are available.

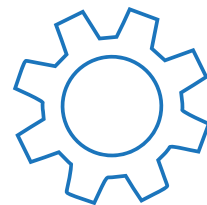


THE ART OF COMPROMISE
IS NOT TO MAKE ANY



DEDICATED TO THE HIGHEST QUALITY AND RELIABILITY

With a long history in producing potentiometers and joysticks we have mastered the art of crafting joystick controllers which are built to the highest standards available in the world.



CUSTOMIZED JOYSTICKS SPECIFICALLY DESIGNED FOR YOU

Almost every industrial controller we produce is a result of intensive co-operation with the end-user. By partnering with our customers engineers we are able to design a joystick controller that exceeds the expectations of our customers.



TECHNICAL SUPPORT THAT GOES THE EXTRA MILE

Our team of experienced engineers are not only involved in the design and production phase of the joystick, but we will be along your side from the very first concept until the installation and during the years of operation.

LARGE COBRA JOYSTICK C90JAM

- Multi functional cobra joystick
- Sensors: Potentiometer, hall effect, encoder, switch(s), pushbutton(s), rocker(s)/seesaw, deadman function etc.
- Applications: Vehicle, crane, marine, robot, etc.
- Protection class: IP54; IP65 option
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

This ergonomically shaped knob can offer you various and complex controls in a wide range: push-buttons, switches and seesaw type potentiometers, which enables such multi-functional operations, are available. Even the whole knob can be rotative on request. Can open output protocols are available.

CANopen **SAE J1939**



AGRICULTURAL MACHINES



ROBUST JOYSTICK S90JA

- Multi functional joystick
- Sensors: Potentiometer, hall effect, encoder switch(s), pushbutton(s), rocker(s)/seesaw, deadman function etc.
- Applications: Special vehicles, cranes, marine, robotics, etc.
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

Special custom designed knobs can offer various and complex controls in wide range of specific applications.



FORESTRY MACHINES







HEAVY DUTY VEHICLES



MINI COBRA JOYSTICK SMHC60JHK

- Multi functional mini cobra joystick
- Sensor: potentiometer, hall effect, switch(es), pushbutton(s), rocker(s)/seesaw.
- Applications: Special vehicles, cranes, robotics, etc.
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

This unique mini cobra shaped knob can offer a wide range of options with pushbuttons and rocker potentiometers. It is designed to function as a multifunctional joystick controller that controls many different movements with only one hand.

CANopen **SAE J1939**

MINING VEHICLES



ATEX JOYSTICK S50JCK-EX



- High quality joystick
- With ATEX components
- 1,2,3 Axis is possible
- Potentiometer and/or switches
- Complete certification on request
- Robust but compact design

Our improved ATEX joysticks are very reliable, and can be customized. You can choose between a 1-, 2- or 3-axis joystick and two different body sizes; S50JCK-EX or S90JCK-EX.

DP JOYSTICK S50JAK

- Specifically designed for dynamic positioning
- Sensors: Potentiometer, hall effect, encoder special features such as switch(s), pushbutton(s), rocker(s)/seesaw, deadman function etc. available on request.
- Applications: Marine, Offshore
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

Today's vessels require high-end computer controlled systems to automatically maintain its position by using the vessels propellers and thrusters. Our joysticks are specifically designed to fulfill the dynamic positioning functions in such applications.



MARINE INDUSTRY



SPECIAL JOYSTICK S50JCK

- Specially designed for steering of hovercrafts
- Sensors: Potentiometer, hall effect, encoder special features such as switch(s), pushbutton(s), rocker(s)/seesaw, deadman function etc. available on request.
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

Hovercrafts also known as an air-cushion vehicle or ACV is a craft capable of travelling over land and water. Hovercrafts are hybrid vessels operated by a pilot as an aircraft rather than a captain as a marine vessel. For controlling the propulsion systems special joysticks are required to steer the vessel into the right direction, and make 'flying' over water a safe and reliable way of transport.



HOOVERCRAFT









ROBOTICS

ROBOTICS JOYSTICK 30JHK

- Specially designed for programming robots
- 3-axis joystick, teach-in panels
- Sensors: Potentiometer, hall effect,
- Applications: Robotics, CCTV, Marine, Vehicle, Automation
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

This little 30JHK joystick is specifically designed for programming robots with a very high accuracy. The small 3-axis joystick is designed for its fine feel-ability when it is controlled by its operator.



FORK LIFT TRUCKS

FINGER JOYSTICK 30JHK

- 1-axis joystick specially designed for forklift trucks. Reliable controller for critical functionalities.
- Applications: Medical, Vehicle, Robotics, Automation.
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

The 30JHK joystick is a miniature industrial controller that can be used on many vehicles that have simple forward backward, or up and down functionalities. A great choice when reliability is key.



PRECISION JOYSTICK 40JB

- 3-axis joystick applied in a medical machine application. The joystick can be designed as a 2 or 3-axis version with one or 2 pushbuttons
- Applications: Medical, CCTV, Vehicle, Robotics, Automation
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

The 40JB / JE hall effect joystick is a multi-purpose joystick which is applied in various applications for example medical machines. The joystick has compact size and fits perfect in a control panel for making accurate movements with high-tech machines.



MEDICAL



CCTV JOYSTICK H40JHK

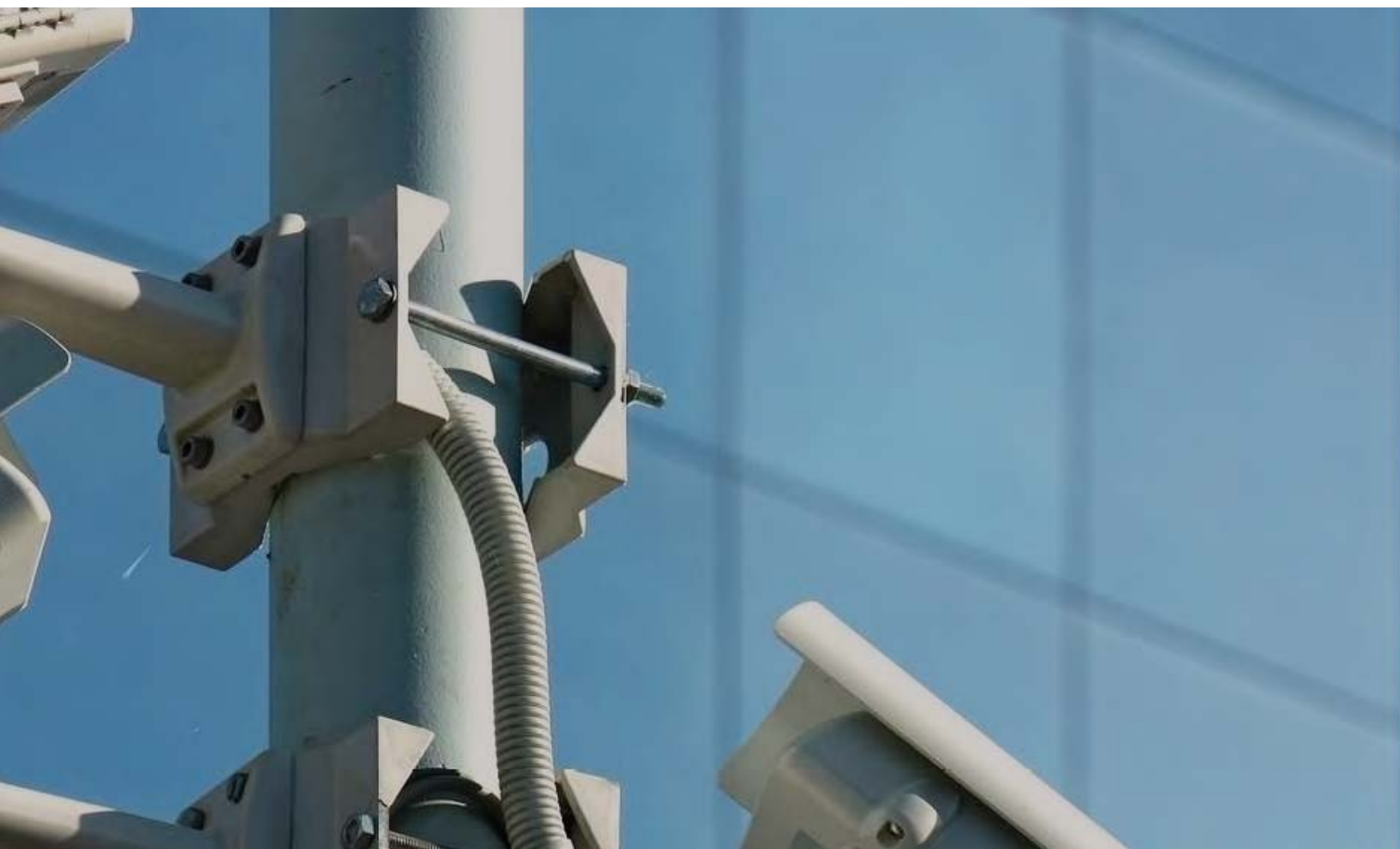
- Robust 3-axis joystick specially designed for CCTV camera control.
- Sensors: hall effect.
Available with round and square movement, with one or 2 pushbuttons and in 2 or 3-axis.
- Applications: CCTV, Marine, Vehicle, Robotics, Automation
- Operating temperature range: -20°C +65°C
- Life expectancy: 5.000.000 operations

The H40JHK hall effect joystick is a multi-purpose joystick which is often applied for surveillance and security applications in combination with CCTV. Because of its compact size it can also be applied in many other industrial applications.



CCTV CAMERA CONTROL





SPECIAL JOYSTICKS

SPECIAL CUSTOM DESIGNED JOYSTICKS

Joystick controllers can be supplied with various special specifications according to customers' request and on the following two pages you see a couple of these examples. Multi-dimensional coordinate operating types other than 1,2,3-dimensional coordinate are available on request.



Knob part for operating Z axis with a built-in linear-motion potentiometer and with a push-button switch.

■ S50JAK-ZT-31R3P



With special "T" shape knob with a push-button switch.

■ S30JLK-XI-11R1GP



Special knob for operating Z axis with 2 micro-switches and a push-button switch.

■ 50JAK-ZR-06R3GP



Round shape knob can only operate on Z axis.

■ S65JHM-ZS-30R3P



Round shape knob with 2 push-button switches.

■ S90JAM-YO-24R2GP



With push-button switch, encoders and gray colored rubber cover.

■ S50JAK-YO-09R2G



With a linear-motion potentiometer for Z axis and special knob with 7 push-button switches.

■ S90JAM-ZZ-36R3G



Seesaw knob used for operating Z axis. The knob is processed with a solid plastic material

■ S50JAK-ZZ-30GP



With an encoder as well as over-drive gears.

■ S50JCK-XI-09G



With over-drive gears together with potentiometers.

■ S90JAM-YX-24R2G



2 axes control. With 4 push-button switches in the hand grip.

■ S90JBM-YO-24R2GP



Special operations by special shaped lever.

■ S150JNK-YS-40

SPECIAL JOYSTICKS

APPLICATION DRIVEN

Our mission is to design the joystick controller that is the perfect fit in its unique application. Over the years we have designed and developed several hundreds of unique joysticks for many different applications. Technically we are capable of many things, you are welcome to challenge us.



Miniature joystick with 2 axis and rocker potentiometer on side of the knob.

■ S30JBK-ZU-30R3GP



1 axis miniature joystick with extra directional switch.

■ S30JLK-XI-12R1GH



1 axis operation + Z-axis function combined with a special knob design.

■ S50JAK-XZ-10R1GP



2 axis hand joystick with special linear operation in the z-axis.

■ S50JAK-ZS-35R3G



3 axis DP joystick with center detent on 2 axis.

■ S50JAK-ZT-30G



1 axis joystick with 6 directional switches and 1 pushbutton on the knob.

■ S50JCK-XI-06G



Special potentiometer + 2 directional switches per axis + 1 pushbutton on the knob.

■ S50JCK-YO-25R2G



2 axis mini cobra joystick with 2 rocker potentiometers on the knob.

■ SMC50JCK-4T-41R4GP



Special large cobra joystick with deadman trigger, 2 rocker potentiometers, aluminated pushbuttons, and ergonomic handgrip.

■ SC90JAM-4U-46R4GP



Large 3 axis joystick with high torque and center detent mechanism on x and y axis, and extra directional switch on the Z-axis.

■ S90JAM-ZZ-30G



3 axis large cobra joystick with complete turning of cobra handle in Z-axis.

■ SC90JAM-ZZ-36R3GP



2 axis 100 series joystick with rocker potentiometer on the side and 1 pushbutton on the top.

■ S100JBM-ZU-31R3G

STANDARD JOYSTICK OVERVIEW

Small














Size of housing

Big








Model No.	Features	Kind of element type	Pot. Mounting Method
H25JB	Very small-sized, joystick controller for industrial use, which accomplished long life-expectancy, high reliability, and robustness. This model can be assembled from both above and under the panel. Possible to be mounted on our cobra shaped knob.	Hall effect IC	Inside
30JB	Most miniaturized series in our joystick controllers. 3-dimensional coordinate type is also available. Spring return device is incorporated inside housing case, and it automatically returns an operating lever to the center position.	Conductive Plastic	Inside
30JE	Modified version of type 30JB, and switches are incorporated inside housing case, instead of potentiometers. Spring return device is incorporated inside housing case.	—	(Switch)
30JH	Low-cost version of 3-dimensional coordinate type joystick controllers and no other dimensional coordinate is available. Spring return device and dust-proof rubber cover are fitted as standard version.	Conductive Plastic	Inside
H30JH	Low-cost version of 3-dimensional coordinate type joystick controller incorporated a hall effect IC type resistive element. It offers long life expectancy and high reliability.	Hall effect IC	Inside
30JL	Low-cost version of 1-dimensional coordinate type joystick controller and no other dimensional coordinate is available. Spring return device is fitted as standard version.	Conductive Plastic	Inside
H30JL	Low-cost version of 1-dimensional coordinate type joystick controller incorporated a hall effect IC type resistive element.	Hall effect IC	Inside
40JB	Low-cost version with widest operating angle among our miniaturized joystick controllers.	Conductive Plastic	Inside
40JE	Almost same outer dimensions as low-cost type 40JB and incorporates code switches of digital output, instead of potentiometers. Spring return device is fitted as standard version.	—	(Switch)
H40JH	Low-cost version of 3-dimensional coordinate type joystick controller incorporated a hall effect IC type resistive element. It offers high-protection and several special outputs.	Hall effect IC	Inside
50JA	Most standardized joystick controllers. Various special specifications are easily available.	Conductive Plastic	Outside
H50JA	H50JA type joystick controller incorporating a hall effect IC type potentiometer, which suits especially for the application with strong vibration.	Hall effect IC	Outside
50JC	Very robust structure featuring dust-proof rubber cover and spring return device, which automatically returns an operating lever to the center position as standard.	Conductive Plastic	Outside
60JB	Low-cost type. Spring return device is incorporated inside housing case, and it automatically returns an operating lever to the center position.	Conductive Plastic	Inside
H60JH	Low-cost version of 2-dimensional coordinate type joystick controller with hall effect IC incorporated, which features the robust structure, and high load strength to the knob.	Hall effect IC	Inside
HMC60JH	Joystick controller with the mini-cobra shaped knob, which is the down sized version of our cobra shaped knob. The dead-man switch is available on the knob for safety design.	Hall effect IC	Inside
90J	Very robust structure. Both potentiometer mounted outside (90JA) and inside (90JB) types are available.	Conductive Plastic	90JA:Outside 90JB:Inside
H90J	90JA/90JB models incorporating a hall effect IC type potentiometer, which offers long life expectancy, high reliability and safety, and are best suitable for special vehicles with strong vibration.	Hall effect IC	H90JA:Outside J90JB:Inside
C90J	90JA or 90JB types joystick controller mounted with cobra shaped knob, which suits for multi-directional operations such as robot operations. It is possible to operate complex functions with push button switches and seesaw motion potentiometer incorporated in the knob.	Conductive Plastic	C90JA:Outside C90JB:Inside
100JB	This model has a seesaw type potentiometer as Z axis potentiometer and only 3-dimensional coordinate type is available. Suitable for various indoor applications.	Conductive Plastic	Inside

SINGLE TURN POTENTIOMETERS

CONTACT TYPE	Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (ϕ mm.)		Protection Grade (IP)		Features			
						Dia.	Shaft Dia.	Standard	Special				
		CP22C	Linear	Wire-wound	Bushing mount	22	6	40	54	Low-cost, metal housing and rear extended lug terminals.			
		CP22E								Low-cost, plastic housing with an internationally patented snapping-in construction and side lug terminals.			
		CP22			Servo mount	27	3			Servomount type with ball bearings and there are 4 kinds of outer diameter. Turret side terminals.			
		CP30											
		CP45				41	6						
		CP50				51							
		FCP12AC			Bushing mount	13	3			Low-cost and rear extended pin terminals.			
		FCP12A								Servo mount	Servomount type with ball bearings and rear extended pin terminals.		
		FCP22AC			Bushing mount	22	6			Low-cost, metal housing and rear extended turret terminals.			
		FCP22E								Low-cost, plastic housing with an internationally patented snapping-in construction and side lug terminals.			
		FCP22R		Low-cost, plastic housing with an internationally patented snapping-in construction and rear-extended turret terminals.									
		FCPS22AC		Low-cost, servomount type with oil-less metal bearing and rear extended turret terminals.									
		FCP22A		Servo mount	27	3			54	Servomount type with ball bearings and there are 4 kinds of outer diameter. Turret side terminals.			
		FCP30A											
		FCP40A									37	6	
		FCP50A									51		
		LNB22		22	2	—	Low-torque, servomount type with ball bearings with outer diameter of 22mm.						

SINGLE TURN POTENTIOMETERS CONTACTLESS TYPE AND OIL-FILLED

CONTACTLESS TYPE	Appearance	Model	Mechanism	Mounting Method	Outer Dia. (φ mm.)		Protection Grade(IP)	Features	
					Body	Shaft			
		KSM22F		Bushing mount		4	40	Popular type with oil-less bearings. Possible to meet with special requirements.	
		KSM22FI					65	Completely sealed type with oil-less bearings. Possible to meet with special requirements.	
		KSM22FS	Inductance type 1-turn contactless	Servomount	22	3	40	Low-torque and long-life type with ball bearings. Possible to meet with special requirements.	
		Bushing mount		4				Low-cost type with oil-less bearings.	
						KSM22EI	54	Simple sealed version of low-cost type with oil-less bearings.	
		HSM12		1-turn, Hall effect IC type			13	6	40 (54 as a Special option)
		HSM18E	Bushing mount/ Flange		20 (except Flange)	40			Small sized long-life 1-turn,Hall effect IC type with flange. Dual output is available. Lug and leadwire are available.
		HSM22	Bushing mount		22.5	65			Small sized long-life 1-turn, Hall effect IC type with effective electrical angle 360 deg. Various special output is available.
		HSM30	Bushing mount/ Flange		27 (except Flange)	65 (67) ※			Robust housing case,long-life type. Standard degree of protection is IP65, which can be used in a severe environment.

OIL-FILLED TYPE	Appearance	Model	Mechanism	Resistive Element	Mounting Method	Outer Dia. (φ mm.)		ProtectionGrade (IP)	Features
						Body	Shaft	Standard	
		OF30	1-turn type	Wire-wound	Bushing mount	32	5	65	Small sized 1-turn and general-purpose type.
		OF50				62	6		General-purpose type with a stopper and suitable for high-voltage use.
		OF50PB							Long-life type with sleeve bearings and a stopper. Suitable for high-voltage use.
		OFCP50			Servo mount	70	Long-life type with servomount and ball bearings. Suitable for precision servo use. (endless)		
		OF30-MCA		Conductive Plastic	Bushing mount	32	5	65	Small sized long-life 1-turn type and with infinite resolution.

SPECIALLY ORDERED POTENTIOMETERS



Flange type, High IP grade
• SFCP18A-10726








Low-torque, 1-turn type with special housing case
• SLNB30-2546B



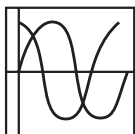
Wire winding type potentiometer
• SFCP50A

SINGLE TURN POTENTIOMETERS NON-LINEAR

NON-LINEAR TYPE CONTACT TYPE	Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (ϕ mm.)		Protection Grade (IP)		Features
						Dia.	Shaft Dia.	Standard	Special	
		SCB50		Wire-wound		51	6			Most popular functional precision pot. with a wirewound resistive element. Sine-cosine output is standard version.
		FSCB22A	Non-Linear	Conductive Plastic	Servo mount	22	3	40	54	Servomount type with ball bearings and precision sine-cosine output potentiometers with 3 different kinds of diameter.
		FSCB30A				27				
		FSCB50A				51	6			

NON-LINEAR TYPE CONTACT TYPE	Appearance	Model	Mechanism	Mounting Method	Outer Dia. (ϕ mm.)		Protection Grade(IP)	Features
					Body	Shaft		
		HSCB22	1-turn, Hall effect IC type	Servomount	22.5	6	40	Long-life, Non-linear type, with precise Sin-Cos output.

Sin-Cos 360°



A precise detection of Sine-Cosine function voltage can be obtained through the shaft revolution of SAKAE Non-Linear Potentiometer Series.

There are 2 kinds of resistive element in the contact type: model SCB (traditional wirewound with high stability) and model FSCB (conductive plastic featuring high speed tracking ability). Also, there is the contactless type, model HSCB with hall effect IC.

SPECIALY ORDERED POTENTIOMETERS



25HP pot. with a small
limit switch adapter
• S25HP- n MS


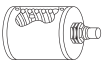












Dual ganged version with
extended rear shaft
• S20HP-10SG





10 ganged version
• S22HPM-10G10










MULTI-TURN POTENTIOMETERS & TURN COUNTING DIALS



CONTACT TYPE	Appearance	Model	Construction	Resistive Element	Outer Dia. (φ mm.)	Shaft Dia. (φ mm.)	Protection Grade (IP)		Features
							Standard	Special	
		10HP	<div>Pipe type</div> 	Wire-wound	10.5	4	40	54	World's smallest multi-turn pot. since 1965.
		12HP (12HP-E)			13	3			Small multi-turn pot. with outer dia. of 13mm. Pin terminals and rear lug terminals are also available in addition to standard lug terminals.
		12HPC (12HPC-E)							Low-cost small multi-turn pot. with outer dia. of 13mm. Pin terminals and rear lug terminals are also available in addition to standard lug terminals.
		20HP			20	6			Precision multi-turn pot. with outer dia. of 20mm. Servomount type and with limit-switch is also available.
		22HP			22	6 6.35			Lowest-cost multi-turn pot. with outer dia. of 22mm. and this pot. has an international patented snapping-in construction.
		25HP			25	4 6			Precision multi-turn pot. with outer dia. of 25mm. There are 4 kinds of shaft and bushing dimensions.
		46HD			<div>Drum type</div> 	46			6
		12HHP (12HHP-E)	Pipe type	Hybrid	13	3			Small size, high resolution and long life are available and outer dimensions are the same as those of model 12HP series.
		20HHP			20	6			High resolution and long life are available and outer dimensions are the same as those of model 20HP series.
		22HHP			22	6 6.35			Low-cost, high resolution and long life are available and outer dimensions are the same as those of model 22HP series. Servomount type is also available.




CONTACTLESS TYPE	Appearance	Model	Mechanism	Mounting Method	Outer Dia. (φ mm.)		Protection Grade (IP)	Features
					Body	Shaft		
		HSM22M	Multi turn, Hall effect IC type	Bushing mount	22.5	6	50	Long-life, multi turn Hall effect IC type. Various special output is available.

OIL-FILLED TYPE	Appearance	Model	Mechanism	Resistive Element	Mounting Method	Outer Dia. (φ mm.)		Protection Grade (IP)	Features
						Body	Shaft		
		OF46HD	Multi-turn type	Wire-wound	Bushing mount	62	6	65	Precision multi-turn type. Servomount type is also available.
		OF20HHP		Hybrid		32			Small sized precision multi-turn type with long-life and high resolution. Servomount type is also available.


LINEAR MOTION POTENTIOMETERS


CONTACT TYPE	Appearance	Model	Resistive Element	Shaft Mounting Method	Outer Dimensions(mm.)		Protection Grade (IP)		Features
					Body()	Shaft Dia.	Standard	Special	
		18LP	Wirewound	Front extended shaft/ Screw holes	20.5 × 18	6	40	54	Robust housing case. Stroke from 15mm. to 100mm. is available.
		8FLP	Conductive Plastic	Front and Rear extended shaft/ Circle holes	8 × 7	2			Miniature sized and low-cost item with leadwire terminals. (Stroke: 10mm.)
		13FLP		Front extended shaft/ Circle holes	11 × 13	M3			Low-cost item with side turret terminals and a thread at the end of shaft. (Stroke: 12mm. to 100mm.)
		15FLP		Front and Rear extended shaft/ Screw holes	15 × 24	M3			Low-cost item with a thread at the end of shaft and short stroke from 10mm. to 30mm.
		18FLPA		Front extended shaft/ Screw holes	20.5 × 18	6			Robust housing case and with faston-terminals. (Stroke: 15mm. to 100mm.)
		18FLPB		Front extended shaft/ Using fixing nails	18 × 18	M4			Connector block on the housing case and a shaft with a cardan joint. (Stroke: 25mm. to 150mm.)
		18FLPC		Front and Rear extended shaft/ Using fixing nails		Ball tip			Connector block on the housing case and a shaft with a spring return device and a ball tip at the end of shaft. (Stroke: 25mm. to 50mm.)
		30FLP		Front extended shaft/ Using fixing nails	35 × 32	M5			Medium and long stroke from 100mm. to 1,000mm. is available and with a connector.
		CFL		Slider/ Circle holes	12 × 20	Travelling by a slider	—	—	Long stroke from 200mm. to 1,000mm. is available. Open-frame housing.

CONTACTLESS TYPE	Appearance	Model	Mechanism	Mounting Method	Outer Dia. (φ mm.)		Protection Grade(IP)	Features
					Body	Shaft		
		LSM22	Inductance type linear-motion contactless	Bushing mount	22	3	40	Linear-motion contactless potentiometer.
		LHK15	Linear-motion, Hall effect IC	Flange	19.5 × 18.9	4	65	Long-life, linear-motion contactless potentiometer with stroke 30mm. Dual output and dual independent output are available.








OIL-FILLED TYPE	Appearance	Model	Mechanism	Resistive Element	Mounting Method	Outer Dia. (φ mm.)		Protection Grade (IP)	Features
						Body	Shaft		
		OF10LP	Linear-motion type	Wire-wound	Bushing mount	12	3	55	Small sized long-life linear-motion type with leadwire terminals. (Stroke: 30mm. to 100mm.)
		OF20LP				20	5		Long-life type with a water-proof connector. (Stroke: 30mm. to 200mm.)
		OF40LP			Ball end mounting	40	With a universal joint		Long-life and long stroke type with a water-proof connector. (Stroke: 100mm. to 300mm.)

SEESAW MOTION /ROCKER POTENTIOMETERS

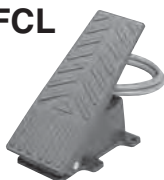
CONTACT TYPE	Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (φ mm.)		Protection Grade (IP)		Features
						Dia.	Shaft Dia.	Standard	Special	
		RMP30A	Linear	Conductive Plastic	Screw mount	W35 × D19 × H35		40	54	Seesaw-motion potentiometer with conductive plastic resistive element.

CONTACTLESS TYPE	Appearance	Model	Output	Resistive Element	Mounting Method	Outer Dimensions (φ mm.)		Protection Grade (IP)		Features
						Dia.	Shaft Dia.	Standard	Special	
		RMP30H	Linear	Hall effect IC	Screw mount	W35 × D19 × H35		65	—	Seesaw-motion potentiometer with hall IC resistive element.

URNS-COUNTING DIALS

Appearance	Model	Read out	Maximum number of Turns Counting	Outer Dimensions(mm.)		Features
				Dia.	Matching Shaft Dia.	
	MA	Analog	3, 5 10, 15 20	φ 54	φ 6	Special graduations are available and this dial is always supplied with a potentiometer.
	MB		3, 5 10	φ 26 φ 31	φ 4 φ 6	The window of read-out is larger for easy reading.
	MF		10 20	15 × 18.5 φ 22 25 × 29 φ 46	φ 3 φ 6	There are 4 kinds of size in this series and all of them have an international patented flexible coupling inside.
	MG		20	φ 22	φ 6	Low-cost and most popular type and 2 kinds of lock mechanism are available.
	DA	Digital	10	φ 24	φ 6	Round-shaped digital read-out dial. 2 kinds of special adaptor in order to adjust the height of dial are available.
	DB		10 100	26 × 44	φ 6	Rectangular shape digital read-out dial. Internationally patented flexible coupling is available.
	DC		10	φ 27 φ 30.5	φ 6	Low-cost and round-shaped digital dial.

H80FCL



200FCL



200FCW



Models		H80FCL	200FCA	200FCW
Approx. Outer Dimensions(mm)D×L (Length of pedal)		100×140(Abt.200)	110×240(Abt.200)	120×220(Abt.220)
Operating Angle(Abt.)		20°	17°	±11°
Total Resistance Value of Potentiometer incorporated		Hall effect IC type potentiometer is mounted. Applied voltage: 5V±10%D.C.		
Optional No. of Switch incorporated (Note)		Up to 2	Up to 2	UP to 2
Degree of Protection	Standard Version	IP65	IP54	IP54
	Optional Version	—	IP65	IP65
Life Expectancy (Abt. ten-thousand)		200	200	100
Spring return device		Standard spec.	Standard spec.	Standard spec.
Code-Switch(Standard switch)		Special spec.	Special spec.	Special spec.
Micro-switch		Special spec.	Special spec.	Special spec.
Alteration of potentiometer's total resistance value		—	Special spec.	Special spec.
Intermediate tap of potentiometers		—	—	Special spec.
Degree of Protection(IP65)		Standard spec.	Special spec.	Special spec.
Pedal locking device		—	—	—
Special stepping angle		—	—	—



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