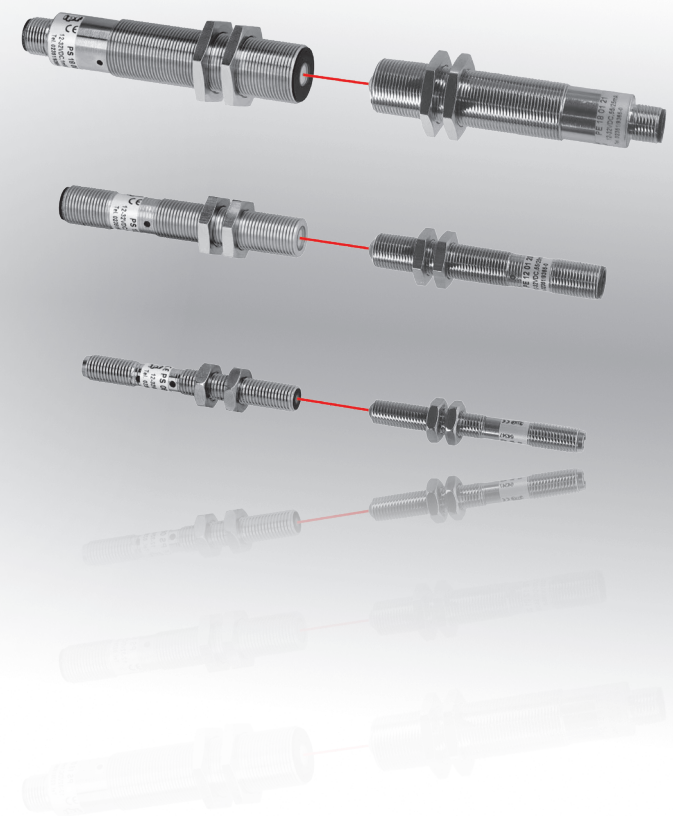
dimensions	**M8x1** **M12x1** **M18x1**	
through-beam sensor	range	**1.5m** **3.0m** **5.0m** **60.0m**



- ✓ **recognition of the smallest of objects**
- ✓ **high switching frequency up to 25kHz**
- ✓ **externally adjustable laser power with function test**
- ✓ **easy alignment with visible red light**
- ✓ **adjustable sensitivity**
- ✓ **robust and insensitive to soiling**
- ✓ **dynamic switching threshold tracking with compensation of the soiling degree**
- ✓ **exact adjustment and mounting with optional angle flange or plain flange**

switching output / analog output
high precision repeat accuracy

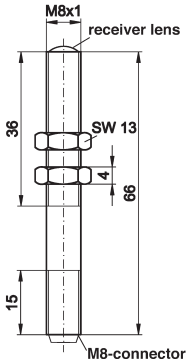
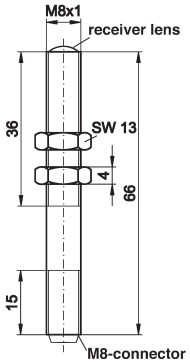
3

description

All through-beam receivers on this data sheet have a digital output. This supplies a 24V DC signal, if the light path between the transmitter and receiver is interrupted (PNP normally open / dark-on mode). Alternatively this supplies a 0V signal, if the light path between the transmitter and receiver is not interrupted (NPN normally closed / light-on mode).
The **PE12...** and **PE18...** devices are additionally equipped with an analog output (0 ... 10V DC). The analog voltage changes with the coverage of the laser beam. This way, it is possible to conduct challenging measuring tasks and adjustment is made easier. At the same time, with the analog signal, the degree of soiling can be monitored.
The transmitting power of the **PE12...** and **PE18...** through-beam transmitters can be set externally. Normally, with the operating voltage connected and open test line (current control input), the transmitting power of the laser is approx. 60%. When connecting the test line to 0V, the transmitting power is 100%. When a voltage between 0V and 5V DC is applied to the test line, each voltage level can be assigned a designated transmitting power between 100% and 0%. This way, the response sensitivity of the light barrier can be influenced. With a current of 5V to 24V DC the laser in the transmitter switches itself off. With this input, it is also possible to carry out a function test for the complete through-beam sensor if the output signal of the corresponding through-beam receiver is evaluated.
A special feature of the through-beam receiver ‚special' version is the automatic tracking of the switching threshold. Consequently, the digital output always switches independently of the degree of soiling of the transmitter or of the receiver, if the light beam is covered up to 90%.

application examples

- ejection check of articles from tools
- reference point sensor for positioning tasks
- scanning of small parts (wires / pegs / drill holes)
- monitoring for completeness in the case of installation tasks
- detection of fast moving components
- measuring tasks via the integration of slit diaphragms

article-no.	**PS080070**	**PS080075**
version	**through-beam transmitter**	**through-beam transmitter**
range	**1.5m**	**5m**
article-no.	**PE080170**	**PE080175**
version	**through-beam receiver**	**through-beam receiver**
output	**pnp, dark-on mode / npn, light-on mode**	**pnp, dark-on mode / npn, light-on mode**
article-no.	**PE080270**	**PE080275**
version	**through-beam receiver**	**through-beam receiver**
output	**pnp, light-on mode / npn, dark-on mode**	**pnp, light-on mode / npn, dark-on mode**
		

TECHNICAL DATA		
range	1.5m	5m
aperture	0.5mm	1.0mm
resolution *	typical 1% of the aperture size	typical 1% of the aperture size
output *	see above	see above
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 30mA (receiver)	≤ 50mA (transmitter) / ≤ 30mA (receiver)
output current (max. load) *	100mA	100mA
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (pulsed)	laser LED	laser LED
wavelength	670nm, red light	670nm, red light
laser class	2	2
switching frequency *	1kHz	1kHz
display (signal) *	-	-
repeat accuracy *	5µm	10µm
	-	-
sensitivity adjustment	-	-
transmitting power	-	-
short-circuit protection	+	+
reverse polarity protection	+	+
dimensions	M8x1	M8x1
length (thread/complete)	36mm / 66mm	36mm / 66mm
housing material	nickel-plated brass	nickel-plated brass
lens material	glass	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
degree of protection (EN 60529)	IP67	IP67
connection	M8-connector, 3-pin	M8-connector, 3-pin
connection accessories	e.g. **VK200275**	e.g. **VK200275**
mounting accessories (flange)	angle: **AP000017** plain: **AP000018**	angle: **AP000017** plain: **AP000018**

* only receiver

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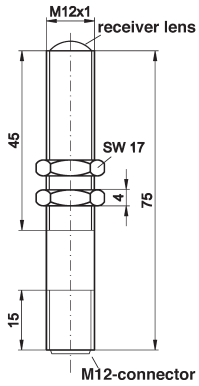
article-no.	**PS120022**
version	**through-beam transmitter**
range	**1.5m**
article-no.	**PE120122**
version	**through-beam receiver**
output	**pnp, dark-on mode / npn, light-on mode** **0 ... 10V DC**

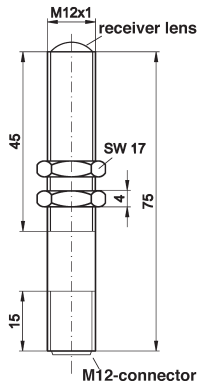
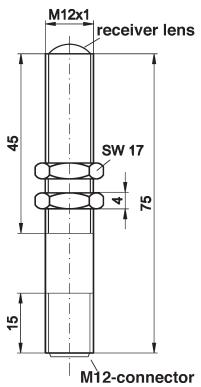


TECHNICAL DATA

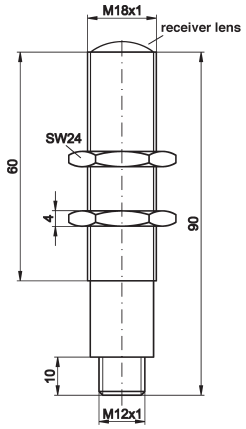
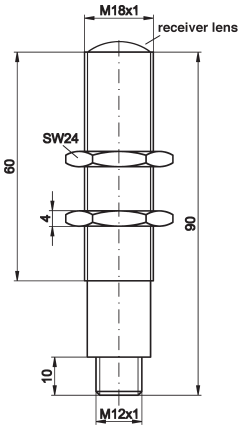
range	1.5m
aperture	0.5mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter)/ ≤ 30mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC
transmitting element (non-pulsed)	laser LED
wavelength	670nm, red light
laser class	2
switching frequency *	25kHz
display (signal) *	-
repeat accuracy *	5µm (digital) / 10µm (analog) -
sensitivity adjustment	-
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+
reverse polarity protection	+
dimensions	M12x1
length (thread/complete)	45mm / 75mm
housing material	nickel-plated brass
lens material	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C
degree of protection (EN 60529)	IP67
connection	M12-connector, 4-pin
connection accessories	e.g. **VK200325**
mounting accessories (flange)	angle: **AP000013** plain: **AP000014**

* only receiver

3

article-no.	**PS120020**	**PS120028**
version	**through-beam transmitter**	**through-beam transmitter**
range	**5m**	**5m**
article-no.	**PE120120**	**-**
version	**through-beam receiver**	**-**
output	**pnp, dark-on mode / npn, light-on mode 0 ... 10V DC**	**-**
article-no.	**PE120121**	**PE120128**
version	**through-beam receiver (tracked)**	**through-beam receiver (tracked)**
output	**pnp, dark-on mode / npn, light-on mode 0 ... 10V DC**	**pnp, dark-on mode / npn, light-on mode 0 ... 10V DC**
		
TECHNICAL DATA		
range	5m	5m
aperture	1.0mm	1.0x2.0mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 30mA (receiver)	≤ 50mA (transmitter) / ≤ 30mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (non-pulsed)	laser LED	laser LED
wavelength	670nm, red light	670nm, red light
laser class	2	2
switching frequency *	25kHz	25kHz
display (signal) *	-	-
repeat accuracy *	10µm (digital) / 20µm (analog) 1µm (tracked)	- 2µm (tracked)
sensitivity adjustment	-	-
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+	+
reverse polarity protection	+	+
dimensions	M12x1	M12x1
length (thread/complete)	45mm / 75mm	45mm / 75mm
housing material	nickel-plated brass	nickel-plated brass
lens material	plastic (PK)	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
degree of protection (EN 60529)	IP67	IP67
connection	M12-connector, 4-pin	M12-connector, 4-pin
connection accessories	e.g. **VK200325**	e.g. **VK200325**
mounting accessories (flange)	angle: **AP000013** plain: **AP000014**	angle: AP000013 plain: **AP000014**

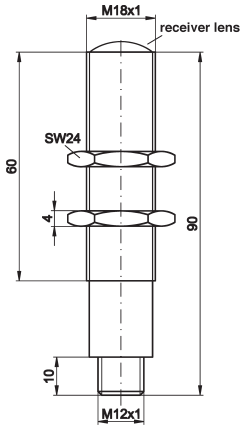
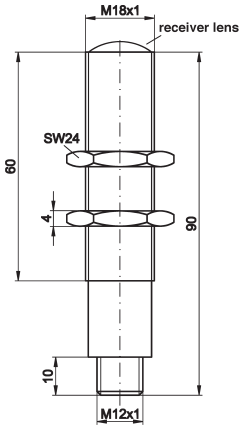
* only receiver

article-no.	**PS180023**	**PS180022**
version	**through-beam transmitter**	**through-beam transmitter**
range	**3m**	**5m**
article-no.	**PE180123**	**-**
version	**through-beam receiver**	**-**
output	**pnp, dark-on mode / npn, light-on mode 0 ... 10V DC**	**-**
article-no.	**-**	**PE180122**
version	**-**	**through-beam receiver (tracked)**
output	**-**	**pnp, light-on mode / npn, dark-on mode 0 ... 10V DC**
		

TECHNICAL DATA

range	3m	5m
aperture	0.5x4.0mm	1.0x6.5mm
resolution *	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)	typical 0.5% of the aperture size (digital) typical 1% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC	pnp, dark-on mode / npn, light-on mode 0 ... 10V DC
operating voltage	12 ... 32V DC	12 ... 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 40mA (receiver)	≤ 50mA (transmitter) / ≤ 40mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element (pulsed)	laser LED	laser LED
wavelength	670nm, red light	670nm, red light
laser class	2	2
switching frequency *	5kHz	5kHz
display (signal) *	red LED	red LED
repeat accuracy *	5µm (digital) / 10µm (analog) -	- 2µm (tracked)
sensitivity adjustment	potentiometer	potentiometer
transmitting power	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%	0V ... 5V DC = 100% ... 0% / 5V ... 24V DC = 0%
short-circuit protection	+	+
reverse polarity protection	+	+
dimensions	M18x1	M18x1
length (thread/complete)	60mm / 90mm	60mm / 90mm
housing material	nickel-plated brass	nickel-plated brass
lens material	glass	glass
temperature (operation/storage)	-20 ... +50°C / -20 ... +85°C	-20 ... +50°C / -20 ... +85°C
degree of protection (EN 60529)	IP67	IP67
connection	M12-connector, 4-pin	M12-connector, 4-pin
connection accessories	e.g. **VK200325**	e.g. **VK200325**
mounting accessories (flange)	angle: **AP000015** plain: **AP000016**	angle: **AP000015** plain: **AP000016**

* only receiver

article-no.	**PS180020**	**PS180025**
version	**through-beam transmitter**	**through-beam transmitter**
range	**5m**	**60m**
article-no.	**PE180120**	**PE180125**
version	**through-beam receiver**	**through-beam receiver**
output	**pnp, dark-on mode / npn, light-on mode 0 … 10V DC**	**pnp, dark-on mode / npn, light-on mode 0 … 10V DC**
article-no.	**PE180121**	**PE180126**
version	**through-beam receiver (tracked)**	**through-beam receiver (tracked)**
output	**pnp, dark-on mode / npn, light-on mode 0 … 10V DC**	**pnp, dark-on mode / npn, light-on mode 0 … 10V DC**
		
TECHNICAL DATA		
range	5m	60m
aperture	1.0mm	2.0x3.0mm
resolution	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)	typical 1% of the aperture size (digital) typical 2% of the aperture size (analog)
output *	pnp, dark-on mode / npn, light-on mode 0 … 10V DC	pnp, dark-on mode / npn, light-on mode 0 … 10V DC
operating voltage	12 … 32V DC	12 … 32V DC
current consumption (w/o load)	≤ 50mA (transmitter) / ≤ 40mA (receiver)	≤ 50mA (transmitter) / ≤ 40mA (receiver)
output current (max. load) *	100mA (digital) / 25mA (analog)	100mA (digital) / 25mA (analog)
voltage drop (max. load) *	2.0V DC	2.0V DC
transmitting element	laser LED	laser LED
wavelength	670nm, red light	670nm, red light
laser class	2	2
switching frequency *	5kHz	5kHz
display (signal) *	-	-
repeat accuracy *	10µm (digital) / 20µm (analog) 1µm (tracked)	20µm (digital) / 40µm (analog) 2µm (tracked)
sensitivity adjustment	-	-
transmitting power	0V … 5V DC = 100% … 0% / 5V … 24V DC = 0%	0V … 5V DC = 100% … 0% / 5V … 24V DC = 0%
short-circuit protection	+	+
reverse polarity protection	+	+
dimensions	M18x1	M18x1
length (thread/complete)	60mm / 90mm	60mm / 90mm
housing material	nickel-plated brass	nickel-plated brass
lens material	plastic (PK)	glass
temperature (operation/storage)	-20 … +50°C / -20 … +85°C	-20 … +50°C / -20 … +85°C
degree of protection (EN 60529)	IP67	IP67 / PS180025 = IP64
connection	M12-connector, 4-pin	M12-connector, 4-pin
connection accessories	e.g. **VK200325**	e.g. **VK200325**
mounting accessories (flange)	angle: **AP000015** plain: **AP000016**	angle: **AP000015** plain: **AP000016**

* only receiver

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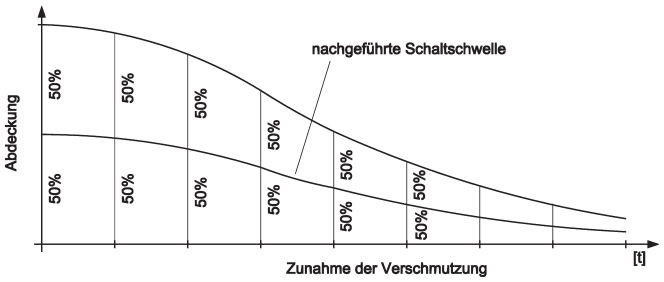
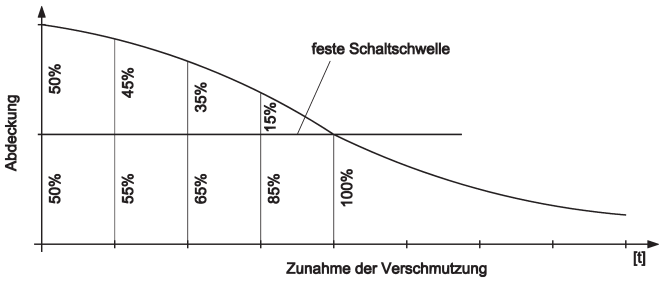
switching thresholds diagram

with tracking (special)

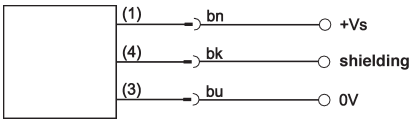


without tracking

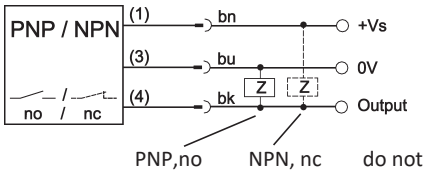


connection

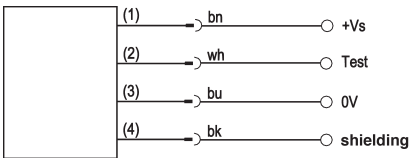
through-beam transmitter, **PS08...**



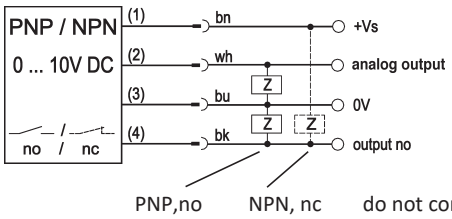
through-beam receiver, **PE08...**



through-beam transmitter, **PS12...** and **PS18...**



through-beam receiver, **PE12...** and **PE18...**



wire colors: bn = brown (1), wh = white (2), bu = blue (3), bk = black (4)

test line and transmitting power setting

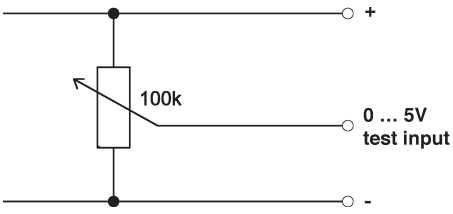
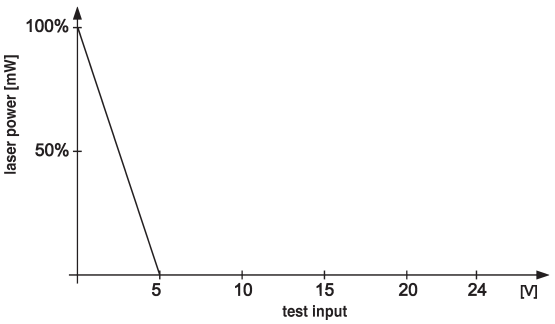


diagram laser power



* test input

The transmitting power can be controlled via the test input of the transmitter!
test input **0V:** transmitting power **100%**
test input **0V to 5V:** transmitting power **100% to 0% continuously adjustable**

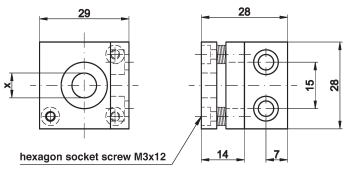
Voltages at the test input exceeding **5V** will cause the transmitter to be **switched off!**

3

mounting accessories

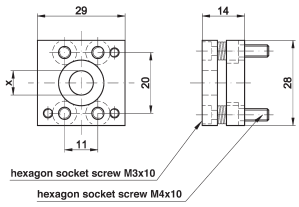
angle flange

AP000017 fitting 8mm

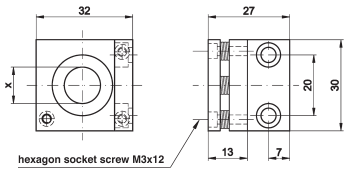


plain flange

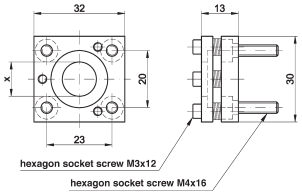
AP000018 fitting 8mm



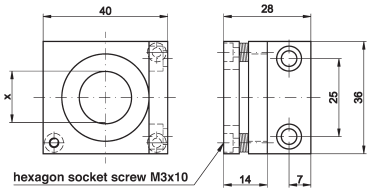
AP000013 fitting 12mm



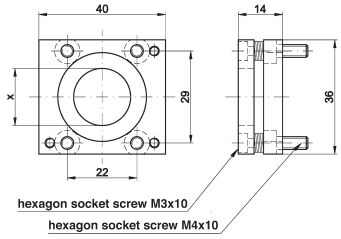
AP000014 fitting 12mm



AP000015 fitting 18mm



AP000016 fitting 18mm



ACCESSORIES

article-no.	description	sensor diameter	material	description
AP000017	angle flange	8mm (dimension X)	aluminum	precise alignment and mounting
AP000018	plain flange	8mm (dimension X)	aluminum	precise alignment and mounting
AP000013	angle flange	12mm (dimension X)	aluminum	precise alignment and mounting
AP000014	plain flange	12mm (dimension X)	aluminum	precise alignment and mounting
AP000015	angle flange	18mm (dimension X)	aluminum	precise alignment and mounting
AP000016	plain flange	18mm (dimension X)	aluminum	precise alignment and mounting

Laser class 1
according to DIN EN 60825-1

This data sheet contains the standard versions only. Kindly request the availability of other output and connection versions.

We will be pleased to supply the matching cable socket for your devices with connector. Please refer to the list in catalog chapter „accessories“ under „cable sockets ipf-*SENSORFLEX®*“ or search our website for „VK“.

Warning: Never use these devices in applications where the safety of a person depends on their functionality.

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